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# *The* JOURNAL of VENEREAL DISEASE INFORMATION

Volume 29

January 1948

Number 1

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UNITED STATES PUBLIC HEALTH SERVICE

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Approved by the Director, Bureau of the Budget, as required by  
Rule 42 of the Joint Committee on Printing



UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.  
Price 10 cents. Subscription price: domestic, 75 cents a year; foreign, \$1.15



# Statistical Indices Used in the Evaluation of Syphilis Contact Investigation<sup>1</sup>

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This paper outlines the method used by the Office of Statistics of the Venereal Disease Division of the United States Public Health Service in evaluating contact investigation. It is intended to be useful to persons who analyze contact investigation and to those who wish a clearer understanding of the various ratios and indices found in the literature. It is hoped that this expository outline of the methods of evaluation of contact investigation will contribute in a small measure to increased case finding.

Contact investigation data are usually studied for one or a combination of the following objectives:

1. To determine the efficiency of contact investigation as a case-finding method.
2. To compare the case-finding efficiency of contact investigation with that of other methods.
3. To detect trends in the achievement of contact investigation.
4. To compare success in different geographic areas in order to identify particularly efficient contact investigation technics or personnel.
5. For general administrative guidance.

## Variations in Methods of Evaluation

Studies of contact investigation vary widely in results and in methods of analysis.

Most studies which show exceedingly high indices of cases brought to treatment use a method of analysis which pyramids

from a fixed base. For example, if A names B, who names C and D, the three infections thus located are regarded as from the original case, even though C and D are not actual contacts of A. Results of different studies therefore are not comparable because of the varying degrees of pyramiding. Furthermore, some studies restrict their base to patients naming contacts, and ignore patients not interviewed or unsuccessfully interviewed. For this reason, all contact investigation indices calculated in the Venereal Disease Division are based on the number of patients in a particular diagnostic category, and on the results of investigation of contacts named by these patients. The relationship of contacts to the patients who named them is maintained, and the base (of diagnosed cases) expands as contacts are identified, examined, and brought to treatment.

Another method commonly used to analyze the effectiveness of contact investigation relates the number of patients brought to treatment through contact investigation to the total number of patients coming to treatment. For example, if 300 cases of primary and secondary syphilis are diagnosed in a particular period, and 75 of them were discovered through contact investigation, it is said that 25 percent of the cases were found through contact investigation. None, all, or any portion of these 75 contacts may have been named by patients diagnosed in the area. Such an analysis gives only a relative measure of the contribution of contact investigation among all methods of case finding, for the percentage varies not only directly with how well contact investigation is being done but also in-

<sup>1</sup> From the Venereal Disease Division, U. S. Public Health Service.

versely with the effectiveness of other methods of case finding. Thus, statements such as "contact investigation contributed 6 percent of the admissions with primary and secondary syphilis, and is seventh in the number of admissions" do not absolutely evaluate contact investigation. They cannot be generalized upon and applied to other areas.

A most important consideration in evaluating contact investigation is the time period covered. It is obvious that a certain amount of time must be allowed to complete investigation. On the other hand, undue delay in examining reported contacts may impair the value of contact investigation in halting further spread of infection. Because there is always the possibility that the contact examined for syphilis may have the disease in the incubation stage, some areas do not require a report on the results of contact investigation before 90 days following the reporting of the contact. Other areas require more prompt reporting of results so that the informant may be reinterviewed if the examined contact is not infected. In many areas, local health departments are encouraged to report dispositions on examined contacts as quickly as possible and to urge contacts to return for further examination at a time indicated by the dates of exposure and of the first examination. In tabulating the results of investigation, the Venereal Disease Division recommends that at least 60 days be allowed for investigation and reporting of dispositions.

### **Evaluation Method Used by the Venereal Disease Division**

In the evaluation indices described subsequently in this paper, contact investigation is measured within itself. If contact investigation is good in an area, the indices will reflect this, regardless of the extent and effectiveness of other case-finding methods. Emphasis on public information will not lower the epidemiologic index; rather, the index may tend to increase as venereal disease education in the community is increased. Contact in-

vestigation thus is measured not in competition but in cooperation with other methods.

The method of evaluation used by the Venereal Disease Division is based on (1) the number of cases of syphilis in a particular diagnostic category (usually primary and secondary) diagnosed in an area during a period (usually 6 months); (2) the number of contacts reported by these cases; and (3) the disposition of the contacts.

In the analysis, 4 indices are calculated which broadly measure the effectiveness of the process: (1) contact index, (2) epidemiologic index, (3) brought-to-treatment index, and (4) lesion-to-lesion index. In order to clarify the meaning of the indices, table 1 is presented as an example, utilizing for convenience a sample of 1,000 cases of primary and secondary syphilis diagnosed in an area during a 6-month period, January through June. Results of investigation are evaluated as of August 31.

### **Contact Index**

The index of contacts reported includes all contacts named by informants (for which contact reports are prepared) regardless of the completeness of information. The disposition is determined by the investigating agency, and a report with an apparently adequate name and address may be determined by the agency to lack sufficient information for an investigation; false addresses are typical examples. Therefore, *the contact index measures the volume but not the quality of contact reporting.* Analyses done by the Venereal Disease Division nevertheless have shown a direct correlation between accomplishment and the volume of reporting—which indicates that the first requisite of effective contact investigation is a high index of contacts reported. As an example, an evaluation of one area over a 6-month period in 1945 showed an index of contacts reported of 4.97 (the highest recorded); the epidemiologic index was 1.19 (also the highest recorded). For the same period, another area showed



**Table 1.—Result of contact investigation on primary and secondary syphilis during a 6-month period, January–June**

[Hypothetical cases]

	Number	Index
Number of cases (previously untreated) diagnosed	1, 000	
Number of contacts reported	2, 316	
Contact index		2. 316
Number of contacts		
(a) with insufficient information to initiate investigation	146	
(b) moved or lives out of area (no disposition returned)	218	
(c) cannot locate	436	
(d) no disposition returned	109	
(e) examined, not infected with syphilis	718	
(f) infected with syphilis	689	
Epidemiologic index		. 689
the 689 infected contacts		
(a) previously admitted to treatment and did not lapse	214	
(b) previously admitted to treatment but returned to treatment through this investigation	78	
(c) brought to treatment as a result of this investigation	397	
Brought-to-treatment index		. 397
the 397 cases brought to treatment		
(a) number in primary or secondary stage	228	
Lesion-to-lesion index		. 228

index of contacts reported of 0.43 (the lowest recorded) and an epidemiologic index of 0.10 (also the lowest). During the following 6-month period, the ratio of contacts reported in the first area dropped to 3.04 and the epidemiologic index dropped to 0.66.

The contact index is valuable for preliminary evaluation of contact investigation programs and for current study to determine areas in which the emphasis in contact investigation has declined.

**Epidemiologic Index**

It is obvious that the reporting of contacts, no matter in what quantity, will not find cases of syphilis or break chains of infection unless contacts are found, examined, and placed under treatment if infected. Some measurement which considers follow-up and examination as well as reporting must be made of the over-all effectiveness of the investigation process. For every known syphilis infection, there exists somewhere at least one other infection—the so-called source. In addition,

there may be other persons with whom the patient was in close physical contact, and to all or some of whom the patient may have transmitted the infection. These are usually described as spread contacts. At any interview it may be impossible and usually is undesirable to attempt to distinguish between source and spread contacts, but it is known that at least one contact exists. Accordingly, the minimum number of contacts reported should be one for each interview, and under ideal conditions of follow-up and of reporting dispositions, the minimum number of infectious located should be one for each patient. How much greater than one will depend on factors such as prevalence in the area and rate of exposure. It should be noted that this index would be at least one even in such cases as A names B, who is infected and whose only contact is A—two patients (A and B); two contacts infected (B and A). *The epidemiologic index, therefore, is the ratio of the number of infected persons identified through contact investigation to the number of patients diagnosed.*

## **Brought-to-Treatment Index**

In general, it is true that any area with a high epidemiologic index is bringing cases to treatment by means of contact investigation. But it is possible to assume conditions in which this would not be true. This can best be explained by a hypothetical example in which an area has such an effective program of public information that every person acquiring syphilis reports voluntarily for treatment; at the same time, contact investigation is carried out efficiently. Further, in each instance contacts, upon being examined (or the records matched), are discovered to have been already admitted to treatment. In such an example, the epidemiologic index would be high, but the actual contribution of contact investigation to the case-finding program would be nil.

Another index is needed, therefore, to measure the effectiveness of contact investigation in finding cases of syphilis previously unknown to medical treatment. This is the *brought-to-treatment index*, which shows the ratio of hitherto unknown cases found through contact investigation to the original patients available for interview. Analyses of data over a 3-year period indicate that this ratio is directly correlated with the epidemiologic index; that is, it is high in the periods and areas in which the epidemiologic index is high, and vice versa. It should be noted that whereas the epidemiologic index measures all infected contacts identified through contact investigation, whether previously treated or not, the brought-to-treatment index measures only the hitherto unknown cases found through contact investigation.

## **Lesion-to-Lesion Index**

In order to stop further spread of infection, contact investigation must find cases in the open-lesion primary or secondary stage. In general, one would expect source contacts to be in the secondary or latent stage upon examination, and the spread contacts to be in

the primary or secondary stage. Without discussing the relative importance of spread and source contacts, it may be stated that from the public health viewpoint the importance of contact investigation lies principally in its ability to find cases in the infectious stages, including the seronegative primary stage. Therefore, a *lesion-to-lesion index* is calculated to show the ratio of contacts with primary or secondary syphilis brought to treatment as a result of contact investigation to patients with primary or secondary syphilis.

The highest lesion-to-lesion index seen in the Office of Statistics of the Venereal Disease Division is in the 6-month period of January through June 1946; an index of 0.47 for a Midwestern State (number of cases exceedingly small). The next highest index for the same period is 0.19 for a Southeastern State. This yield of 19 primary and secondary cases found for every 100 primary and secondary cases available for contact investigation seems very low when compared with some published studies. Nevertheless, only two other areas with substantial data show higher indices within any of the consecutive 6-month periods from July 1943 to January 1947. (These were indices of 0.24 and 0.27 for one area in the two semiannual periods in calendar year 1945, and 0.23 for the other area in the second half of 1946.) Among the various areas this index ranges downward to 0.03, and the average is around 0.14. Therefore, based on the achievement in a group of States during 1946 and considering the improvement shown throughout the period 1943 through 1946, an index of 0.19 reflects relatively good performance.

## **Additional Factors Important to Evaluation**

Although the indices described permit an evaluation of contact investigation, further analysis of contact investigation data is often necessary for administrative guidance. Weaknesses in procedures must be determined so that improvement may be effected. This is particularly nec-

sary where different agencies or components of a single agency are responsible for different phases of the program.

Another useful index which may be calculated is the ratio of contacts located and examined to the total contacts reported for investigation. This index generally depends, of course, upon two factors: (1) the completeness of identifying information obtained during the interview, and (2) the effectiveness of agents or agencies in locating contacts. For this reason, calculations which evaluate the effectiveness of contact location are usually divided into two groups: (1) complete and (2) incomplete information. The information is grouped so that cases with a name and address are considered as complete information, and cases without name or address (in which descriptions and nicknames are the chief aids to identification) are considered as incomplete. Of course, some cases with complete information cannot be located upon investigation because false addresses have been given or the person sought has moved; and some cases with incomplete information can nevertheless be identified and located. However, the arbitrary groupings have been found useful in general analyses. State health departments sometimes prepare periodic analyses, which are presented to local units in the form of tables, bar charts, and narrative, in an effort to improve procedures in contact location.

An analysis of classifications among the group of contacts not examined will contribute importantly to any review of contact investigation in an area. Any representative group of contact report forms would reveal that the most common factors are as follows:

#### ***Insufficient Information to Begin Investigation***

This disposition is sometimes checked arbitrarily by investigating agencies. A review of individual forms may indicate that interviewers are supplying data obviously insufficient for investigation, or that follow-up workers are using this

category as an easy way of closing difficult cases.

#### ***Moved Out of Jurisdiction***

This item is checked when a forwarding address or at least sufficient information is obtained to refer the case to a new jurisdiction. It has become a considerable item in recent years. If the new area is not requested to report back on the results of investigation, the epidemiologic index and other indices of accomplishment will be correspondingly lowered. Also, from the point of view of effective contact investigation, dispositions should be reported so that reinterviewing may be effected, when advisable.

#### ***Cannot Locate***

This item is usually reviewed to determine the efficiency of follow-up workers in locating cases, although the quality of information obtained is, of course, a factor in the analysis. Some areas have spaces on their contact report forms for recording the reason the contact was not located, such as "not known at address," "moved from given address, new address not determined," and "no such address."

#### ***No Disposition Returned***

It is possible that a complete job has been done on these cases, but usually it is found that unreported investigations are uncompleted investigations. The reporting of dispositions within a reasonable length of time is necessary to a comprehensive analysis of contact investigation, and this analysis, in turn, determines what administrative measures should be taken. Successful contact investigation entails examination of actual results as a means to continued improvement.

#### ***Not Cooperative***

This item is usually included with "other" dispositions, as no special provision is made for it on most State forms, and it is generally a small category. It includes contacts who were located but refused to come in for examination, or



contacts who refused to return for re-examination. If the item is relatively large, an investigation as to the reason would be advisable.

### **Additional Variables in Analysis**

Some of the complications encountered in analyses of contact investigation have been mentioned—variations in pyramiding, bases, and time periods. A brief review of other elements may be of value.

### ***Previous Treatment of Informant***

Patients admitted to treatment who have had previous treatment for the infection (transfers) are generally interviewed for contact information. However, it is impossible to establish standards of what should be expected in this category. It is recommended, therefore, that calculation of indices exclude previously treated patients and their contacts. Calculation should be based upon previously untreated patients, so that the intrinsic accomplishment of the contact investigation process may be evaluated.

### ***Previous Treatment of Infected Contacts***

Infected contacts under treatment may be divided into two groups: (1) those under treatment prior to the investigation, and (2) those brought to treatment as a result of the investigation. In cases of reinfection or clinical relapse, the distinction between the groups is not so obvious. Such cases, even though previously admitted to treatment, should be included in the brought-to-treatment group because they are open-lesion cases discovered and

brought to treatment as a result of the investigation.

### ***Duplicate Dispositions***

When a person is reported twice within the same period as a contact of different patients, he must be considered in classification as two separate cases. If the contact is not brought to treatment, no confusion will ensue in having duplicate dispositions. If, however, the person is brought to treatment as a result of contact investigation, he cannot be counted twice in this category. The correct method is to count the case as "brought to treatment" on the first contact report and as "under treatment prior to investigation" on subsequent reports.

### ***Duplicate Contact Reports***

The trend toward in-patient care provides opportunity for reinterview of patients in rapid treatment centers after the initial interview in the local clinic. There is a possibility of duplication unless the interviewer in the rapid treatment center is told what information has already been obtained in the clinic or health department. One of the methods used to avoid duplication is to enter on the patient's referral form the names of contacts obtained in the clinic. Probably a better method is to attach to the referral form a copy of the epidemiologic report for each contact. If duplicate reports are prepared in spite of these precautions, or because additional information is obtained, the duplication can be corrected in central registries or at the local investigation level.

# Status of Contact Investigation<sup>1</sup>

## An Evaluation of Data From State and Local Health Areas<sup>2</sup>

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A previous paper (1) in this series has described in detail the indices used by the Venereal Disease Division to measure the effectiveness of syphilis contact investigation, and the methods used in obtaining these indices. It is the purpose of the present paper to use these indices to describe the accomplishments of contact investigation in certain areas for which reports have been received, and to analyze further the meaning of the various indices which have been calculated. Our analysis seems to show that, in terms of present-day operating programs, the greatest improvement in the field of contact investigation can be obtained through better contact interviewing. Further studies are needed to point out specific ways in which this improvement can be obtained, and continuing analysis is needed to keep pace with changing conditions in the field.

The material presented consists largely of reports showing the number of cases of primary and secondary syphilis<sup>3</sup> admitted to public treatment facilities in an area during a 6-month period, the num-

ber of sexual contacts reported by these cases, and the outcome of the investigation of these contacts. Such reports were available from 16 States and 4 large cities for the last 6 months of 1946.<sup>4</sup>

In addition, reports were available from some areas which make it possible to compare achievements over a period of several years. Analysis is also made of reports showing the number of sexual contacts of primary and secondary syphilis to be investigated in an area, and the outcome of the investigation of these contacts. Reports of this type were available for the period July to December 1946 for six States and two large cities.

### Accomplishments in Contact Investigation

Table 1 presents the accomplishments in contact investigation in 20 areas during the period July to December 1946. Although all of the indices presented indicate that there is room for improvement, some areas show very creditable achievements.

The measurements presented in this paper are prepared by a method which was developed in the Venereal Disease Division, and which has been used consistently in our analysis of contact investigation since 1942. The method differs from those used in many studies by various investigators (1), and therefore the results presented are not strictly comparable with those of many of these studies. Nevertheless, the achievements

<sup>1</sup> From the Venereal Disease Division, U. S. Public Health Service.

<sup>2</sup> Prepared from semiannual epidemiologic evaluation reports submitted at the request of the Venereal Disease Division by the health officers of the following States and cities: Alabama, Arkansas, Chicago, Colorado, District of Columbia, Georgia, Iowa, Kansas, Kentucky, Michigan, Mississippi, Nebraska, New York City, North Carolina, Ohio, Oklahoma, St. Louis, South Carolina, Texas, West Virginia.

<sup>3</sup> Because of lack of consistent data, due to variation among areas in policy and attitude concerning the interviewing of latent syphilis patients for contact information, this paper is limited to a discussion of contacts of primary and secondary syphilis.

<sup>4</sup> These are areas which use a method of tabulation from which such data can be secured. They represent every section of the country except the Pacific Coast and New England.

TABLE 1.—*Indices of effectiveness of contact investigation based on admissions of previously untreated cases of primary and secondary syphilis, 20 areas, July-December 1946*

Area	Previously untreated primary and secondary admissions	Contact index <sup>1</sup>	Percentage of contacts examined	Percentage of examined contacts who were infected	Epidemiologic index <sup>2</sup>	Brought-to-treatment index <sup>3</sup>	Lesion-to-lesion index <sup>4</sup>
			<i>Percent</i>	<i>Percent</i>			
A.....	51	3.31	64	40	0.84	0.57	0.39
B.....	515	1.63	67	52	.57	.30	.17
C.....	1,956	2.01	55	61	.67	.28	.18
D.....	705	1.69	62	38	.40	.29	.13
E.....	1,946	2.47	69	41	.70	.45	.23
G.....	1,032	1.58	44	70	.49	.24	.15
H.....	1,212	1.69	58	57	.56	.24	.14
I.....	512	2.04	42	51	.44	.21	.11
J.....	721	1.58	43	66	.45	.19	.09
K.....	1,227	1.92	60	49	.56	.22	.14
L.....	663	2.02	26	47	.24	.11	.03
M.....	161	1.94	43	60	.50	.27	.19
N.....	1,355	1.67	54	61	.55	.22	.11
P.....	1,210	2.41	51	47	.59	.30	.08
Q.....	2,593	1.38	51	60	.42	.26	.13
R.....	779	1.21	55	60	.39	.23	.12
S.....	1,369	.87	55	62	.29	.14	.06
T.....	87	1.32	54	66	.47	.38	.28
U.....	1,657	.87	51	49	.22	.11	.06
V.....	106	.99	58	43	.25	.12	.08

<sup>1</sup> Number of sexual contacts obtained per previously untreated primary and secondary admission.  
<sup>2</sup> Number of syphilis infections identified through contact investigation per previously untreated primary and secondary admission.  
<sup>3</sup> Number of new cases of syphilis found through contact investigation per previously untreated primary and secondary admission.  
<sup>4</sup> Number of new cases of primary and secondary syphilis found through contact investigation per previously untreated primary and secondary admission.

of areas showing the greatest accomplishments compare favorably with those of other studies, especially when it is recognized that the figures presented in this paper are composite achievements of many different clinics, and were obtained by employees of various health departments who had other duties to perform.

In any of the indices chosen for comparison, we find a variation from area to area. In the number of sexual contacts obtained per primary or secondary case admitted to treatment (contact index), we find a range from 0.87 contacts in the lowest area to 3.31 in the highest, the highest area securing 3.8 times as many sexual contacts per admission as the lowest. In the number of syphilis infections identified through contact investigation per new case of primary and secondary syphilis admitted (the epidemiologic index) we also find a wide variation. Here, the range is from 0.22 infections in the lowest area to 0.84 in the highest, the

highest area identifying 3.9 times as many infections as the lowest. When we consider the number of previously undiagnosed cases brought to treatment through contact investigation per primary or secondary admission, we find that the variation is still greater, from 0.11 to 0.57, the highest area finding 5.2 times as many new cases per admission as the lowest. And in the number of new cases of primary and secondary syphilis brought to treatment per primary and secondary admission, we find a range of from 0.03 to 0.39, the highest area finding 13 times as many cases as the lowest.

There is also some variation in the percentage of contacts reported by various areas who are later located, but this variation, although statistically significant, is not nearly so great as the variations shown by the other indices. (For practical purposes, the percentage located in these areas can be considered equivalent to the percentage examined, since so few



located contacts refused examinations.) The range here is from 26 percent to 69 percent, the highest percentage of cases reported by any one area being only 2.7 times that of the lowest. The percentage of examined contacts who were found to be infected also varies, ranging from 38 percent to 70 percent, the highest percentage being 1.8 times that of the lowest.

The great degree of variation among areas in epidemiologic indices and contact indices is emphasized in table 1. Even greater variation would be shown if individual counties or clinics were compared.

In calculating epidemiologic indices, the results of investigations completed outside the area are included. To some extent, therefore, the epidemiologic index for an area is determined not only by how well that area completes its own investigations, but also by the efficiency of other areas to which contact reports are referred for investigation. The epidemiologic index for an area also will be lowered to the extent that other areas fail to report back on contacts that they identify as being infected.

For control purposes, many areas prepare reports showing the disposition of all contacts specified to an investigating agency, regardless of the source of the contact report. The usual procedure is to classify such contact reports into those with complete name and address and those without such complete identifying information. Reports showing results of the investigation of these two classes of contacts were available from eight areas, and are summarized in table 2. As was to be expected, a larger percentage of contacts with complete information was located in each area. No area located all such contacts, however, and every area was able to locate a certain percentage of those contacts with incomplete information. Until an investigation has been completed, it is impossible to know when a complete name and address may be false or in error, and when an exceedingly thin thread of information may lead to the discovery of a contact.

A study of table 2 indicates a close relationship between the percentage of contacts located when the information is complete and the percentage located when the information is incomplete. Areas which locate a high percentage of contacts with complete information also locate a higher than average percentage of contacts with incomplete information.<sup>5</sup>

TABLE 2.—*Location of contacts of primary and secondary syphilis reported for investigation, by completeness of information, 8 areas, July–December 1946*

Area in which contacts were investigated	Percentage of contacts located in each group	
	Complete information given <sup>1</sup>	Incomplete information given <sup>2</sup>
K.....	75.8	63.7
L.....	75.3	26.3
H.....	71.3	37.8
V.....	71.1	54.5
D.....	69.9	59.8
S.....	62.9	15.5
C.....	62.5	45.5
Q.....	38.3	20.2

<sup>1</sup> Includes only cases where complete name and address were given (including family).

<sup>2</sup> Includes only cases where complete name and address were not given.

### The Contact Index and the Epidemiologic Index

The level of efficiency in contact investigation, as measured by the epidemiologic index, depends on: (1) the number of sexual contacts secured from each patient diagnosed; (2) the percentage of contacts named who are located and examined; and (3) the percentage of contacts examined who are found to be infected. A study of these three factors gives an indication of the relative importance of each in explaining why some areas have high epidemiologic indices and some low, and why the epidemiologic index for an area goes up or down. Our analysis resulted in the following general conclusions:<sup>6</sup>

<sup>5</sup> See Statistical Appendix, page 12, paragraph 1.

<sup>6</sup> See Statistical Appendix, page 12, paragraphs 2, 3, 4, for a description of the procedure followed.

1. Differences in the percentages of examined contacts who are infected do not explain differences in epidemiologic indices.

2. Differences in the percentages of contacts located and examined account for only a small portion of the differences in epidemiologic indices.

3. Most of the differences between epidemiologic indices can be explained by differences in contact indices. Areas obtaining the largest number of sexual contacts per primary and secondary admission consistently attain the highest epidemiologic indices. This indicates the importance of improvement in contact interviewing in any effort to increase the efficiency of contact investigation as a case-finding method.

Since the differences in contact indices appear to explain most of the differences in epidemiologic indices, a further analysis was made of the relationship of contact indices to the other two factors. The following general conclusions were drawn:<sup>7</sup>

1. Areas with the best contact indices do not seem to have reached the point where the number of contacts per patient has been increased by the addition of persons with little likelihood of being infected.

2. High contact indices do not seem to have been accompanied by a lowered quality of identifying information.

The epidemiologic index is a measure of the total number of syphilis infections identified, and does not tell how many of these infections are new cases and how many represent cases previously known to treatment sources. The relative amounts of these two types of cases are dependent primarily on other factors, particularly the level of other methods of case finding in the area. Further studies are needed to determine the relative importance of these factors.

In summary, a high epidemiologic index depends on: (1) a high contact index; (2) a high percentage of successful

locations and examinations; and (3) a high percentage of infections in the group examined. Since factors 2 and 3 are relatively constant from area to area, the variation in the epidemiologic indices is largely due to differences in the degree of success in contact interviewing.

### Recent Trends

It is encouraging to note that in general there is an upward trend in the epidemiologic indices of those areas for which we are able to make comparisons between different time periods (table 3).

It will be seen from this table, however, that improvement in contact investigation is not always a steady upward progression. In fact, some areas which achieved a very high level in one period made disappointing showings in the next. It is discouraging to see that 10 of the 20 areas listed showed a downward trend between the first half and the second half of 1946. We can hope that these decreases are temporary and due to local conditions which can be improved, and not symptoms of a general letdown in the fight against syphilis.

Table 3 lists the contact indices for the various time periods as well as the epidemiologic indices, and it can be seen again that there is a close relationship between these two values. In every instance in which there was a decrease of any size in the contact index there was a corresponding decrease in the epidemiologic index, and when the contact index went up the epidemiologic index did also.

The contact investigation process is affected by an infinite variety of circumstances. From the material presented, it is impossible to get a lead on many of these which may be connected with local conditions and personalities. Perhaps a study of reports from many individual clinics would give us more information on this vital subject. However, present data do give us information from which to make a more detailed study of indices of contact investigation by race and sex. It is planned to present this study in a later paper in this series.

<sup>7</sup> See Statistical Appendix, page 12, paragraphs 5 and 6.

TABLE 3.—Epidemiologic ratios based on admission of previously untreated cases of primary and secondary syphilis in 20 areas, July 1943–December 1946

Area	Contacts obtained per previously untreated primary or secondary admission							Epidemiologic index <sup>1</sup>						
	July-December 1943	January-June 1944	July-December 1944	January-June 1945	July-December 1945	January-June 1946	July-December 1946	July-December 1943	January-June 1944	July-December 1944	January-June 1945	July-December 1945	January-June 1946	July-December 1946
-----	1.26	1.77	1.62	1.79	2.12	2.38	1.63	0.23	0.46	0.50	0.51	0.67	0.82	0.57
-----	.47	1.17	1.70	2.58	4.97	3.04	1.69	.15	.42	.55	.84	1.19	.66	.40
-----	1.10	1.29	1.16	1.92	1.67	2.02	2.04	.31	.42	.32	.54	.43	.51	.44
-----	1.89	1.47	2.07	2.82	1.94	2.46	2.02	.32	.31	.39	.39	.34	.45	.24
-----	1.04	.95	1.32	1.36	2.05	1.47	-----	.30	.26	.38	.37	.55	.37	-----
-----	-----	-----	1.56	2.70	2.68	2.37	2.01	-----	-----	.52	.80	.77	.74	.67
-----	-----	-----	1.09	1.69	1.97	1.79	1.69	-----	-----	.30	.52	.54	.52	.56
-----	-----	-----	1.23	1.43	1.19	1.54	.87	-----	-----	.26	.34	.23	.32	.29
-----	-----	-----	-----	1.12	1.42	3.95	3.31	-----	-----	-----	.22	.28	1.00	.84
-----	-----	-----	-----	1.77	2.26	2.14	2.47	-----	-----	-----	.52	.69	.63	.71
-----	-----	-----	-----	1.38	1.62	1.98	1.58	-----	-----	-----	.32	.36	.53	.49
-----	-----	-----	-----	1.24	1.82	1.52	1.92	-----	-----	-----	.40	.44	.45	.56
-----	-----	-----	-----	.63	3.38	1.28	1.67	-----	-----	-----	.25	.96	.43	.55
-----	-----	-----	-----	-----	.98	1.51	1.58	-----	-----	-----	.27	.48	.45	.45
-----	-----	-----	-----	-----	.43	1.39	2.41	-----	-----	-----	.10	.36	.59	.59
-----	-----	-----	-----	-----	2.03	1.33	1.21	-----	-----	-----	.67	.34	.39	.39
-----	-----	-----	-----	-----	-----	1.10	1.70	-----	-----	-----	-----	-----	.24	.33
-----	-----	-----	-----	-----	-----	.59	.90	-----	-----	-----	-----	-----	.10	.24
-----	-----	-----	-----	-----	-----	.77	.99	-----	-----	-----	-----	-----	.14	.32
-----	-----	-----	-----	-----	-----	.61	.39	-----	-----	-----	-----	-----	.12	.09

<sup>1</sup> Number of syphilis infections identified through contact investigation per previously untreated primary or secondary admission.

# Summary and Conclusions

1. Analysis is made of reports from State and local health departments showing achievements in contact investigation of cases of primary and secondary syphilis admitted to public diagnostic facilities.

2. The following general conclusions were reached:

Although there is a great deal of room for improvement, some areas have achieved a very creditable level of performance.

Areas which examine a high percentage of contacts with complete information also examine a higher than average percentage of contacts with incomplete information.

Differences in the percentages of examined contacts who are infected do not explain the differences in epidemiologic indices.

Differences in the percentages of contacts located and examined account for

only a small portion of the differences in epidemiologic indices.

Most of the differences between epidemiologic indices can be explained by differences in contact indices. Areas obtaining the largest number of sexual contacts per primary and secondary admission consistently attain the highest epidemiologic indices. This indicates the importance of improvement in contact interviewing in any effort to increase the efficiency of contact investigation as a case-finding method.

The point has not been reached where the number of contacts per patient has been increased by the addition of persons with little likelihood of being infected.

High contact indices do not seem to have been accompanied by a lowered quality of identifying information.

In general, there has been an upward trend in the achievements of contact



investigation in these areas, but improvement in contact investigation is not a steady upward progression, and calls for constant effort.

3. More detailed reports are necessary if all the factors of importance in achieving better results in contact investigations are to be identified.

### Statistical Appendix

1. A total of 58 pairs of observations was available for the investigation of the relationship between the percentage of contacts with complete name and address who were located and the percentage of contacts without such complete information who were located, covering 6-month periods between July 1943 and January 1947. A positive correlation coefficient of 0.686 was obtained, which was significant at the 1-percent level. Testing for linearity indicated that there was no significantly greater curvilinear relationship.

2. A total of 71 pairs of observations was available for the investigation of the relationship between the percentage of examined contacts who were infected and the epidemiologic index, covering the 6-month periods between January 1945 and January 1947. A negative correlation of 0.125 was obtained which was not statistically significant even at the 10-percent level. Testing for linearity indicated that there was no significantly greater curvilinear relationship.

3. A total of 71 pairs of observations was available for the investigation of the relationship between the percentage of all reported contacts examined and the epidemiologic index, covering the 6-month periods between January 1945 and January 1947. A positive correlation coefficient of 0.380 was obtained which was

significant at the 1-percent level. Testing for linearity indicated that there was no significantly greater curvilinear relationship.

4. A total of 89 pairs of observations was available for the investigation of the relationship between the contact index and the epidemiologic index, covering the 6-month periods between July 1943 and January 1947. A positive correlation coefficient of 0.305 was obtained which was significant at the 1-percent level. Testing for linearity indicated that there was no significantly greater curvilinear relationship.

5. A total of 71 pairs of observations was available for the investigation of the relationship between the percentage of examined contacts who were found infected and the contact index, covering the 6-month periods from January 1945 to January 1947. A negative correlation coefficient of 0.305 was obtained which was significant at the 1-percent level. Testing for linearity indicated that there was no significantly greater curvilinear relationship.

6. A total of 71 pairs of observations was available for the investigation of the relationship between the percentage of all reported contacts examined and the contact index covering the 6-month periods from January 1945 to January 1947. A positive correlation coefficient of 0.078 was obtained which was not significant even at the 10-percent level. Testing for linearity indicated that there was no significantly greater curvilinear relationship.

### References

1. ISKRANT, A. P.; KAHN, H. A.: Statistical indices used in the evaluation of syphilis contact investigation. *J. Ven. Dis. Inform.*, 29: 1-6, 1948.

# The 100-Day Experiment in Contact Investigation in Arkansas<sup>1</sup>

Edgar J. Easley, M. D.; <sup>2</sup> George E. Parkhurst, Surgeon, <sup>3</sup> United States Public Health Service; and Robert R. Swank, Public Health Extension Specialist, United States Public Health Service

The known contacts of patients with an infectious disease—that is, the persons from whom the infection may have been acquired and to whom the disease may have been transmitted—theoretically form the most productive group in which to search for new and unknown cases of that disease. Acting on this theory, persons engaged in efforts to control venereal disease through active case finding have long made contact investigation an integral part of their program. With the increasing scope of the control program, however, there is increasing awareness that the identification of this group of contacts, and the subsequent examination of the individuals in the group, present a series of such difficult problems that the efficiency of the method has been questioned in some quarters.

In an effort to discover what results might be achieved by contact investigation under conditions existing in most health departments, with certain changes in emphasis and procedure but with no additional personnel in local areas, the Arkansas State Board of Health, in cooperation with the United States Public Health Service, undertook an experiment in this method of case finding during the period March 31 through July 8, 1947. During this period a sixfold improvement was

made in the over-all results of contact investigation, and almost eight times as many cases of primary and secondary syphilis were found through contact investigation as would have been found through normal operations.

## Description of Area and Facilities

Three counties were chosen for this experiment—Jefferson, Pulaski, and Garland. The population distribution of the counties is shown in table 1. Two lay investigators were assigned to the Pulaski County area; one in the city of Little Rock and one in the remainder of the county. Four clinics were in operation in Pulaski County. One investigator was assigned to each of the other counties, in each of which one clinic was in operation.

All three counties lie within a radius of 75 miles of the rapid treatment center at Hot Springs, where the vast majority of patients with infectious syphilis are referred for treatment. An epidemiologist, well trained in methods of contact investigation, was stationed at the rapid treatment center. He directed and coordinated the activities of the investigators, and in addition personally interviewed all patients with primary or secondary syphilis referred to the rapid treatment center from these counties.

It should not be assumed that conditions in the local areas covered by this experiment were in any respect ideal from the standpoint of venereal disease control, or even appreciably better than conditions

<sup>1</sup> Conducted by the Arkansas State Board of Health in cooperation with the U. S. Public Health Service, Mar. 31, 1947, through July 8, 1947.

<sup>2</sup> Venereal Disease Control Officer, Arkansas State Board of Health.

<sup>3</sup> Medical Officer in Charge, U. S. Public Health Service Medical Center, Hot Springs National Park, Ark.

TABLE 1.—*Population distribution in areas included in Arkansas experiment in contact investigation*

Counties	1940 <sup>1</sup> population					1943 <sup>2</sup> population
	Total	Urban <sup>3</sup>		Nonwhite		Total
		Number	Percent	Number	Percent	
Pulaski.....	156,085	109,176	69.9	43,208	27.7	165,771
Jefferson.....	65,101	21,290	32.7	36,022	55.3	72,752
Garland.....	41,664	21,370	51.3	5,069	12.2	37,888
Total.....	262,850	151,836	57.8	84,299	32.1	276,411

<sup>1</sup> Source: 1940 Census.

<sup>2</sup> Source: Most recent Census estimate.

<sup>3</sup> Includes cities of more than 2,500.

usually found in local health departments. In many ways the conditions within these areas were much less conducive to good results than conditions normally found in many other areas. The problems which face any venereal disease control officer were here in abundance. Good medical coverage at a local clinic, both as to clinic hours and the diagnostic acumen of the examiner, is vital to a successful program of contact investigation. In only one of the three counties was such medical coverage approximated. In the other two, the intrinsic problems of contact investigation were further complicated by few and inconvenient clinic hours and the clinics' poor reputation locally. In one area the investigator had to carry almost the whole of the diagnostic burden as well as to attempt to investigate contacts.

The success of the experiment was further hindered by a telephone strike which prevented any rapid exchange of contact information during the first 30 days of the project, and by a tornado which curtailed any consideration of venereal disease control in one area for a period of almost 2 weeks. Furthermore, the most experienced clinician in the three counties was on leave for 5 weeks of the experiment.

The above description indicates that conditions in these local areas were indeed far from ideal.

## Changes From Usual Emphasis and Procedures

### Concentration on Syphilis

From the standpoint of control, of the five venereal diseases syphilis is usually recognized to be the major problem, and it is generally conceded that the investigation of contacts of primary and secondary syphilis is vastly more productive than the investigation of contacts of other stages of syphilis. This latter point is strengthened by an analysis presented in the January–March 1947 Statistical Letter (1), which indicated that through contact investigation an average of 0.14 new cases of primary or secondary syphilis were brought to treatment per primary and secondary patient admitted, but only 0.03 new cases of primary or secondary syphilis were brought to treatment per early latent patient.

However, over-all epidemiologic activity has been apportioned by health departments on a basis of 17 percent for contact investigation of primary and secondary syphilis and 83 percent for contact investigation of other stages of syphilis and of the other venereal diseases, and for case holding and posttreatment observation (2).

Contrary to the usual procedure, then, the Arkansas project was set up to concentrate all intensive epidemiologic activ-



ity on primary and secondary syphilis patients and their contacts. It was believed that 100-percent activity applied to just this infectious group would produce several times the results previously obtained in these areas.

### ***Increased Emphasis on Interviewing***

Heretofore unpublished studies of the Venereal Disease Division have indicated that differences between areas in the success of contact investigation could largely be attributed to differences in the amount of contact information obtained from the original patients. Because of the very personal and intimate nature of the information requested, and because of the moral and sometimes even legal implications of this information, it might well be considered that contact interviewing is the most difficult process in contact investigation.

It was determined, therefore, to make every effort to obtain the most complete and accurate contact information possible. To secure this result, the four investigators were given a refresher course at the rapid treatment center in methods of contact interviewing, and were made responsible for interviewing every case of primary and secondary syphilis discovered in their areas. In addition, every patient referred to the rapid treatment center was exposed to a group patient-education program, illustrated with slides, after which they were reinterviewed for contacts by the epidemiologist. Neither the patient-education programs nor the individual interviews were of the "stuffed-shirt" variety, nor were they staid courses in physiology or pathology, but rather were down-to-earth discussions of the how and why of syphilis infection. Color slides of actual syphilis lesions were used.

### ***Cooperation and Coordination of Interviewing and Investigating***

It was felt that a great deal could be gained by the closer coordination of interviewing and field locating; that is, the interviewer should also be the field inves-

tigator, or at least there should be a very close tie-up between the interviewer and the investigator. Part of this objective was attained by making each investigator responsible for the interviewing of all cases of primary and secondary syphilis found in his area. In addition, close liaison between the rapid treatment center and the field was obtained by the use of the telephone as a routine procedure. Since the average patient stay at the rapid treatment center was 10 to 11 days, it is obvious that this period could be used for effective interchange of information between the informant, the epidemiologist at the rapid treatment center, and the field investigators.

### ***Supervision and Training***

Before the beginning of the experimental period, the four investigators were given a short refresher course not only in interviewing techniques but also in methods of field location. In addition, the epidemiologist made occasional visits to each county and was in constant telephonic contact with each county to aid in the solution of specific problems and to give general advice and assistance. Monthly summary reports to each local health department compiled by the epidemiologist also served to keep each investigator aware of the progress being made by the others, and of any discoveries concerning new methods or techniques.

It is felt that much of the success of this experiment was due to these visits by the epidemiologist, particularly in view of the short duration of the original training course.

### ***Importance of Prompt Location of Contacts***

If contact investigation is to realize its inherent possibilities to stop the spread of syphilis infection, the named contacts must be located, examined, and if necessary placed under treatment as speedily as possible. Speed is an important factor in the successful location of these persons, many of whom are exceedingly migratory. Therefore, as a goal,

attempts were made to have each contact located and examined within the first 4 days after the preparation of the contact report form. This was, of course, impossible in many cases, particularly in the area where the investigator had to serve as clinician and clerk in addition to his duties as contact investigator.

Of the contacts investigated, 98 percent were exposed 4 months or less before the date of interview.

Results

Table 2 shows the detailed results of this experiment in contact investigation. Table 3 shows a comparison of the results achieved in this period with results in the same area in a previous period, and with results achieved in other areas.

Epidemiologic Index

It will be seen from table 3 that the epidemiologic index of 1.61 (the number of cases of syphilis identified through contact investigation per previously untreated primary and secondary admission) achieved during the experimental period is almost six times as high as that achieved in the same area in a previous period, and is the highest index as yet reported in the Statistical Letter. It is considerably higher than the previous

TABLE 2.—Results of Arkansas experiment in contact investigation of previously untreated primary and secondary syphilis patients

Primary and secondary patients diagnosed.....				201
Contacts reported by these patients.....				655
Contacts located and examined.....			516	
Not infected with syphilis.....		185		
Infected with syphilis.....		324		
Already under treatment.....	157			
Brought to treatment.....	167			
Primary syphilis.....	31			
Secondary syphilis.....	63			
Early latent syphilis.....	58			
Late latent syphilis.....	13			
Asymptomatic neurosyphilis.....	2			
Diagnosis not completed <sup>1</sup> .....			7	
Uncooperative.....				7
Not located.....				132
Unable to locate.....		89		
Moved out of jurisdiction.....		28		
Insufficient information to begin investigation.....			7	
No disposition returned.....			8	

<sup>1</sup> These cases represent sexual partners, who, by their own admission, were actually contacts to infectious patients who named them as contacts. On examination no evidence of syphilis was found, but the contacts were offered and accepted treatment on the strength of epidemiologic history.

high of 1.19 reported in the second half of 1945, and is almost twice as large as any index reported during the last half of 1946 (3).

We feel that the achievement of an index of this size in local health departments which are not extraordinary in any way indicates that the possibilities inherent in contact investigation are usually not even approached.

TABLE 3.—Indices of results of contact investigation in Arkansas experiment, compared with previous results in the same area and with highest indices previously reported elsewhere

	Contact index			Percent- age of reported contacts who were located	Percent- age of exam- ined contacts who were infected with syphilis	Epi- demi- ologic index	Brought- to- treat- ment index	Lesion- to- lesion index
	Total	Clinic	Rapid treat- ment center					
Arkansas experiment in contact in- vestigation.....	3.26	1.20	2.24	79.8	163.6	1.61	0.83	0.47
Same area, January-March 1946.....	.69	.13	1.68	64.7	66.3	.30	.11	.06
Highest previously reported <sup>2</sup> .....	4.95			69.0	78.0	1.19	.70	.47

<sup>1</sup> Based on 509 examined contacts. (See text.)  
<sup>2</sup> Statistical Letter, published quarterly by the Office of Statistics, Venereal Disease Division, U. S. Public Health Service.

### ***Brought-to-Treatment Index***

During the program period, 0.83 cases of syphilis, previously unknown to any treatment source, were brought to treatment as a result of contact investigation per previously untreated primary and secondary admission. This brought-to-treatment index is almost 8 times that achieved in the same area during a previous period, and is again the highest such index ever reported, comparing with the previous high of 0.70 reported in the first half of 1946.

The ratio of the brought-to-treatment index to the epidemiologic index is of course affected by the level of other case-finding activities and by the readiness of the general population to seek diagnosis on the appearance of symptoms possibly syphilitic in nature (4). There is no need to be discouraged if this ratio is low, as long as the epidemiologic index is high. Such a situation might well indicate that the other case-finding efforts in the area are very successful.

### ***Lesion-to-Lesion Index***

The lesion-to-lesion index of 0.47 cases of primary or secondary syphilis brought to treatment per previously untreated primary and secondary admission is almost eight times higher than that previously reported from this area. It equals the highest such index ever reported, or 0.47, in the first half of 1946. The size of this index indicates the success of a program of contact investigation in finding cases of syphilis while they are in an infectious stage.

It should be noted at this point that 37 of the 58 cases classified as early latent were found in the county in which the investigator had to serve as clinician and clerk as well as investigator. Over half of these patients gave a definite history of lesions existing at the time of the origin of the contact report, and would have been diagnosed as primary or secondary if the investigation could have been completed immediately. This illustrates the supreme importance of speed in contact investigation, and the necessity of making

sure that the investigator is not so tied down with other duties that he cannot complete his investigations promptly.

### ***Contact Interviewing***

A large part of the success of the program can be attributed to the quality of the contact interviewing. The ratio of 3.26 contacts reported per patient is almost five times as great as the contact ratio obtained in this area in a previous period. The contact ratio obtained by interview at the local clinics is over nine times that reported previously, and the contact ratio obtained by reinterview at the rapid treatment center of the 185 patients referred there for treatment is about one and one-half times as large as was reported previously. This fact indicates that tremendous improvements in contact interviewing can be achieved by health department workers if they are properly trained and their efforts directed to this end.

An analysis of the number of contacts reported by 177 of the patients, classified by race and sex, is presented in table 4. It will be seen that there is a great range in the number of contacts reported by different individuals, from the noncooperative patients who named no contacts to the nonwhite patient who named 10. It is felt that the lack of realization that patients may name more than 2 or 3 contacts is probably responsible for many failures in contact investigation. Because of this extreme variability we are unwilling to state that the average number of contacts reported by one group is higher or lower than that reported by another, since the chance occurrence of one or two such productive patients in a small group can well distort the picture. Of the 4 groups presented in table 4, the only statistically significant difference discovered is between white males and nonwhite males. It is not the purpose of this paper to discuss the possible reasons for this difference, and we would not say that the same difference would be found elsewhere, but these points might well be investigated.



TABLE 4.—*Contacts named by primary and secondary syphilis patients in Arkansas experiment in contact investigation, by race and sex of patients*

	Number of patients naming stated number of contacts				
Number of contacts named per patient	White		Nonwhite		Total
	Male	Fe- male	Male	Fe- male	
0-----	2	0	1	0	3
1-----	6	1	3	10	20
2-----	7	1	15	11	34
3-----	3	3	19	22	47
4-----	2	2	20	14	38
5-----	3	1	8	3	15
6-----	0	0	7	1	8
7-----	0	1	5	1	7
8-----	0	0	1	1	2
9-----	0	0	1	1	2
10-----	0	0	1	0	1
Total patients	23	9	81	64	177
Average number of contacts named per patient-----	2.26	3.55	3.87	3.10	3.26

It is fallacious to believe that the maximum in interviewing efficiency was reached. On the contrary, it is well-known to those directing the project that many "hot" contacts were not elicited. A checking of cross-contact naming proves this fact. It was particularly difficult to draw information from white females, with the white males almost as difficult. For reasons such as false chivalry, fear of loss of friendship, embarrassment, possible retaliations, revelation of confidences, marital discords, family relationships, fear of exposure, and plain distrust, informants in many instances tend to withhold one or two of their most important contacts.

Reinterviews for better contact information were requested from the field on about 17 percent of the contacts, and in 42 instances this procedure was helpful in locating contacts who would normally have been lost.

Although a record was kept of the total number of sexual contacts admitted by the 201 cases, no epidemiologic report form was made on any contact for whom insufficient information was elicited to begin investigation. Judgment in this re-

spect was apparently excellent, since only seven such epidemiologic dispositions were returned. Because of insufficient information, epidemiologic report forms were not prepared on 41 sexual contacts admitted by the 201 informants.

Percentage Located

The securing of adequate information in the contact interview—as correct and complete as possible—and then the prompt and ingenious utilization of the information by the investigator are essential to successful contact location. Of the contacts reported during this project, 79.8 percent were located. The disposition of the contacts who were not located is shown in table 2. This 79.8 percent located is better than the 64.7 percent located during a previous period in the same area, and is higher than any corresponding percent reported in the Statistical Letter.

Of the 133 contact forms sent outside the project area for investigation, to date 91 have been returned with dispositions, which include seven primary and secondary contacts brought to treatment. Ten of the ninety-one contacts were found be already under treatment.

Percentage Infected

Of the 516 contacts located and examined, diagnosis was completed on 509. The other 7 cases represent sexual partners who, by their own admissions, were actually contacts to infectious patients who reported them. On examination there was no clinical or serologic evidence of syphilis, but they were advised to have treatment on the strength of epidemiologic history; they accepted this therapy. In computing the percentage of examined contacts who were found infected, these 7 cases were omitted, and the percentage was computed on the basis of the contacts on whom diagnosis was definitely completed.

The percentage found infected, 63.6 percent of the total contacts on whom diagnosis was completed, approximates the situation found in other areas.

Although each contact found to be negative on initial examination was followed for a period extending 90 days after the date of last exposure, all but 7 of the 94 cases of primary and secondary syphilis brought to treatment as the result of contact investigation were found on the initial clinical examination. However, an interesting case is presented:

H. K., Negro male, age 19, single, was named as a contact to a patient with secondary syphilis. He was found 3 days after the contact form was sent to the field. Initial examination for syphilis was negative, but the patient had gonorrhea, so was given 300,000 units of penicillin in oil-beeswax. Subsequently, he was re-examined at intervals, with the last examination exactly 3 months after the date of exposure. Five days after this examination, he returned for the last report. He was asked, "How do you feel?" He replied, "I have a small pimple on my privates." He was re-examined clinically and a darkfield examination was done, which was positive. The diagnosis was primary syphilis, darkfield-positive, seronegative.

### Summary

1. During the period March 31 through July 8, 1947, an experiment was undertaken to discover what results could be obtained by intensifying the program of contact investigation of early syphilis.

2. No additional personnel were employed in local areas, and the three counties chosen for the experiment were in no way ideal from the standpoint of venereal disease control facilities.

3. By directing all epidemiologic activities to contacts of primary and secondary syphilis, by increasing the amount of attention given to the contact interview, by creating better cooperation and coordination between interviewer and investigator, and by providing investigators with additional training and adequate supervision, a sixfold improvement was made in the over-all results of contact investigation and almost eight times as many cases of primary and secondary syphilis were found through contact investigation as had been found through previous operations.

### References

1. Statistical Letter. Published quarterly by the Office of Statistics, Venereal Disease Division, U. S. Public Health Service.
2. Unpublished data. Office of Statistics, Venereal Disease Division, U. S. Public Health Service.
3. ISKRANT, A. P.; RION, J. W.: Status of contact investigation: An evaluation of data from State and local health areas. *J. Ven. Dis. Inform.*, 29: 7-12, 1948.
4. ISKRANT, A. P.; KAHN, H. A.: Statistical indices used in the evaluation of syphilis contact investigation. *J. Ven. Dis. Inform.*, 29: 1-6, 1948.

## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of all articles concerned with venereal diseases or related subjects which have been published in the better known journals both here and abroad during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

### ACTA DERMAT.-VENEREOL., STOCKHOLM

Examinations of syphilitic patients with the Weltmann reaction. Stephen Pastinszky and Edmund Füsthy. 27: 267-274, 1947.

### AM. J. MED., NEW YORK

Renal damage resulting from idiosyncrasy to neoarsphenamine. Richard H. Anderson. 2: 121-125, Jan. 1947.

Pulmonary embolism caused by penicillin-oil-beeswax. An experimental investigation with report of a near-fatal case. Philip K. Bondy, Walter H. Sheldon and H. Stephen Weens. 3: 34-43, July 1947.

Electrophoretic study of sera from patients with pinta and yaws. M. L. Dillon. (American Federation for Clinical Research. Annual Meeting held in Chicago, Apr. 28, 1947.) 3: 115, July 1947.

Enhancement of plasma penicillin concentrations by caronamide and sodium benzoate. Elias Strauss. (American Federation for Clinical Research. Annual Meeting held in Chicago, Apr. 28, 1947.) 3: 121-122, July 1947.

\*Enhancement of penicillin blood levels in man by means of a new compound, caronamide. Christopher C. Shaw, William P. Boger, J. William Crosson, Walter W. Kemp, William S. M. Ling and Garfield G. Duncan. 3: 206-210, Aug. 1947.

**Enhancement of penicillin blood levels in man by means of a new compound, caronamide.** Christopher C. Shaw, William P. Boger, J. William Crosson, Walter W. Kemp, William S. M. Ling and Garfield G. Duncan. *Am. J. Med.*, 3: 206-210, 1947.

The authors describe a new approach to the problem of inhibition of excretion of penicillin by the kidneys by utilizing to advantage the properties and characteristics of a new compound, caronamide.

The efficacy of penicillin as a therapeutic agent depends upon obtaining the optimum concentration in the body tissues. It has been assumed that the higher the concentration of penicillin in the plasma, the higher will be the concentration in the tissues, although certain disease conditions may require much higher levels for curative effects.

Various means have been devised, directed to secure an effective blood level, among which are: (1) increased dosage; (2) more frequent administration; (3) variation in the route of administration; (4) attempts to slow absorption from the site of injection; and (5) use of substance to retard excretion by the kidneys.

Since 80 percent of absorbed penicillin is excreted by the renal mechanism, renal "retardants" are being investigated to determine their clinical suitability. This paper reports experience with this method of retardation of renal excretion by administering caronamide by mouth simultaneously with penicillin intramuscularly. The results of the following studies undertaken at the Pennsylvania Hospital are discussed: (1) The simultaneous oral administration of penicillin and caronamide every 4 hours to a group of six afebrile patients for six consecutive days; (2) penicillin given by intramuscular injection and caronamide by mouth to an additional five patients; and (3) the effect of caronamide by mouth on penicillin in beeswax and oil in three other patients.

The authors conclude that the new drug, "Staticin" caronamide, will inhibit the



renal tubular excretion of penicillin and thereby elevate the concentration of penicillin in the plasma from twofold to sevenfold following oral and/or parenteral administration of penicillin. Caronamide should be of definite clinical value in the treatment of disease conditions in which high penicillin blood levels are required, it is claimed. Caronamide is administered by mouth, usually in doses of 2.0 gm. every 3 or 4 hours, concomitantly with penicillin. Given in these doses, the drug produced no evidence of renal, bone marrow, or hepatic impairment, dermatitis, or drug fever in this small series of patients.

AM. J. M. SC., PHILADELPHIA

Virus pyogen and virus pyogen photosensitivity relationships in cutaneous disease. John H. Stokes, Herman Beerman and Norman R. Ingraham, Jr. *Progress of Medical Science. Dermatology and Syphilology*. 213: 494-501, Apr. 1947.

Studies in the oral administration of penicillin. I. Assays of various preparations and the determination of the effective therapeutic dose. William S. Hoffman and Italo F. Volini. 213: 513-519, May 1947.

The present status of tryparsamide in syphilotherapy. Herbert Koteen. *Progress of Medical Science. Therapeutics*. 213: 611-620, May 1947.

AM. J. OBST. & GYNEC., ST. LOUIS

Syphilis in pregnancy treated by penicillin. C. H. Ingram. 53: 881-882, May 1947.  
Granuloma inguinale of the cervix. Swan Burrus. 54: 135-136, July 1947.

\*Lymphopathia venereum complicating labor. An analysis of thirty-eight cases. Irwin H. Kaiser and Edward L. King. 54: 219-229, Aug. 1947.

\*Lymphogranuloma venereum in obstetrics. Charles M. Steer. 54: 230-234, Aug. 1947.

**Lymphopathia venereum complicating labor. An analysis of thirty-eight cases.** Irwin H. Kaiser and Edward L. King. *Am. J. Obst. & Gynec.*, 54: 219-229, 1947.

The complication of pregnancy and the impedimentation of labor by the inflammatory lesions of lymphogranuloma venereum are discussed. The dystocia produced by this disease falls into two anatomic groups, one type caused by the ele-

phantiasis-esthiomene variety of vulvar lesions, and the other type caused by extensive scarring of the soft tissues of the pelvis, the rectum usually being the first involved.

The authors discuss a series of 38 deliveries in 26 women with pelvic lymphogranuloma venereum observed at the Charity Hospital in New Orleans between 1937 and 1946. Details of this study disclose no maternal deaths and no exacerbation of the lymphogranuloma in association with pregnancy in any individual. Duration of total labor was not increased, and three cesarean sections were performed in the group.

Among 162 cases of lymphogranuloma venereum now available for study in the literature, the maternal mortality rate was seen to be approximately 6 percent, death being due usually to rupture of the rectum or uterus, either of which may occur with spontaneous delivery, which occurred in 104 of the 162 cases. It is stressed by the authors that forceful delivery must be avoided in any patient with pelvic lymphogranuloma who shows evidence of dystocia. In scarring of the pelvic tissues so extensive as to preclude the passage of the presenting part, an elective section is to be performed rather than forceps or version, regardless of the dilation of the cervix.

Postpartum care of patients with lymphogranuloma venereum should be most meticulous for the first 24 hours, with immediate exploratory laparotomy on the appearance of peritoneal irritation or shock suggesting rupture of the uterus or rectum.

**Lymphogranuloma venereum in obstetrics.** Charles M. Steer. *Am. J. Obst. & Gynec.*, 54: 230-234, 1947.

The author presents a study made at the Sloane Hospital for Women of 75 pregnant women with lymphogranuloma venereum. Sixty-eight of the patients were Negro and 7 were white, and in 39 of the group, lymphogranuloma venereum was associated with one or more of the other venereal diseases (syphilis, gonorrhea, and chancroid).

The late stages of lymphogranuloma venereum, according to the author, may give rise to two pathologic syndromes of obstetrical significance: (1) the anorectal syndrome; and (2) the genital syndrome of esthiomene. In patients with either type of involvement, there may occur an exacerbation of the disease during pregnancy, with the rectal involvement proceeding to the point of complete rectal obstruction in some cases.

Three cases of anorectal involvement are described: (1) a case of rupture of a rectal stricture terminating fatally; (2) a case of acute flare-up of the disease in the sigmoid and rectum; and (3) a case of long-standing stricture in which complete intestinal obstruction developed during pregnancy.

The syndrome of esthiomene or elephantiasis has also produced a number of cases of dystocia, one case being reported in which ulceration and elephantiasis of the vulva caused such difficulty of extraction as to necessitate perforation of the after-coming head. Another case of marked elephantiasis of the labia minora and clitoris with constriction and induration of the vaginal introitus made cesarean section necessary.

It is stated, in conclusion, that pregnancy is not advisable in patients with active lymphogranuloma venereum or rectal stricture, and that termination of pregnancies which have occurred in such cases should be considered. Cesarean section remains the method of choice in patients with rectal stricture or esthiomene, with vaginal delivery and manipulation carried out only when unavoidable.

AM. PRACTITIONER, PHILADELPHIA

\*Lymphogranuloma venereum. John Parks and C. K. Fraser. 1: 371-374, Mar. 1947.

**Lymphogranuloma venereum.** John Parks and C. K. Fraser. Am. Practitioner, 1: 371-374, 1947.

The authors discuss the various characteristics of lymphogranuloma venereum, including its affinity for the lymphatic tissues, its susceptibility to treatment with the sulfonamide drugs, its incuba-

tion period of 5 to 21 days, and its high incidence in warm, moist climates.

In the early acute phase of the disease secondary infection following the primary ulcer may be accompanied by edema, lymphadenopathy, and pain; associated with this phase are fever, chills, anorexia, and joint pain. In the chronic phase of the disease, ulceration, fistula formation, and distortion of vulvar and vaginal structures may result, with chronic, purulent proctitis commonly seen as an accompaniment of rectal stricture. Debility, weight loss, anemia, and hyperglobulinemia may accompany this chronic phase.

A high incidence of rectovaginal fistula, rectal stricture, and soft-tissue obstruction to childbirth is found with the anorectal type of lymphogranuloma venereum. While the disease seldom extends above the lower one-third of the vagina it is noted that distortion of the cervix and vaginal vault is possible, and that the large, granular, ulcerated lesions involving the vulva are frequently a precursor of carcinoma.

The importance of differential diagnosis is stressed, and a chart is presented listing the differential tests for ulcerative lesions of the genitalia. While a definitely positive Frei test means present or past lymphogranuloma infection, it is pointed out that little evidence exists for the transmission of infection through the placenta to the unborn child.

Medical treatment, consisting preferably of sulfadiazine, will arrest infection and cause complete healing of all tissues not involved by necrosis or extensive fibrosis. Intracutaneous, subcutaneous and intravenous injections of increasing doses of Frei antigen may be used in some cases to reactivate the infection, which will then respond to sulfonamide therapy.

Surgical treatment may consist in aspiration of fluctuant buboes, excision of large, chronic, distorted vulvar stricture, dilation of strictures by digital or instrumental methods, and colostomy for patients with absolute stricture of the rectum, according to the authors.



ARCH. ITAL. DI DERMAT., SIF., BOLOGNA

Sedimentation rate of the blood as an index of specific reactions in syphilis. (La velocità di sedimentazione delle emazie come indice di reazioni specifiche nella sifilide.)

A. Bergamasco. 19: 83-95, 1946. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 2: 264-265, June 1947.]

ARCH. NEUROL. & PSYCHIAT., CHICAGO

\*Value of penicillin in treatment of neurosyphilis. Bernhard Dattner. New York Neurological Society. Mar. 5, 1946. Society Transactions. 57: 270-273, Feb. 1947.

**Value of penicillin in treatment of neurosyphilis.** Bernhard Dattner. New York Neurological Society. Mar. 5, 1946. Society Transactions. Arch. Neurol. & Psychiat., 57: 270-273, 1947.

The author, in dealing with the numerous problems involved in an evaluation of the success of neurosyphilitic treatment, discusses the following points: (1) Reversible and irreversible signs and symptoms exist side by side in the disease; (2) improvement of symptoms may be only transitory; (3) signs and symptoms may persist or even become more pronounced although the syphilitic process has been definitely arrested; and (4) the syphilitic infection may be quite active within the central nervous system and still be asymptomatic.

The author emphasizes that clinical manifestations are not always reliable criteria as to the activity of the disease process; for instance, in treated cases, the Wassermann and colloidal gold reactions of the spinal fluid may continue to be positive after treatment has checked the syphilitic process. However, if cell counts are normal and protein determinations show definite improvement 6 months after treatment, it is considered unlikely that the infectious process will again become active within the central nervous system.

The author presents a table showing the results of penicillin treatment at Bellevue Hospital of 112 patients with neurosyphilis. This group, which included patients with asymptomatic and meningovascular syphilis, tabes dorsalis,

dementia paralytica, and tabetic form of dementia paralytica, received total dosages ranging from 2,000,000 to 9,000,000 units of penicillin, administered intramuscularly at 3-hour intervals over periods of 9 to 25 days. Of this group of 112 individuals, only 2 were definite failures, 15 were considered indefinite (spinal fluid syndrome showed borderline cell count of 4 or 5 cells per cubic centimeter), and 95 were successfully treated.

It is concluded that penicillin in adequate dosages is as effective as combined fever and specific therapies, although the optimal time-dose relationships have not been as yet determined.

BULL. JOHNS HOPKINS HOSP., BALTIMORE

Disappearance time of *Treponema pallidum* from lesions of early syphilis following administration of crystalline penicillin G. Harold A. Tucker and Raymond C. V. Robinson. 80: 169-173, Mar. 1947.

BULL. U. S. ARMY M. DEPT., WASHINGTON

Developments in military medicine during the administration of Surgeon General Norman T. Kirk. (Second of two articles). 7: 594-641, July 1947.

A case of lymphogranuloma venereum and syphilis. F. C. Pannill, Jr. 7: 817, Sept. 1947.

BUMED NEWS LETTER (U. S. NAVY DEPT.), WASHINGTON

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CALIFORNIA'S HEALTH, SACRAMENTO

Statistics show high VD incidence in lower age groups. 4: 186, June 15, 1947.

Infectious syphilis rates in five industrial areas compared. 5: 203, July 15, 1947.

Infectious syphilis 25 percent of total. 5: 223, Aug. 31, 1947.

CALIFORNIA MED., SAN FRANCISCO

Physical fitness should be measured by employability. 67: 22, 24, 26, Aug. 1947.

CANAD. NURSE, MONTREAL

They too are our patients. [Including venereal diseases.] Pearl Stiver. Public Health Nursing. 43: 443-446, June 1947.

COMPT. REND. SOC. DE BIOL., PARIS

Syphilis et infection récurrentielle. (Syphilis and relapsing fever.) C. Levaditi, A. Vaisman and H. Noury. 139: 972-974, Nov. 1945. [Abstracted in Trop. Dis. Bull., London, 44: 718, Aug. 1947.]



## HEALTH NEWS, ALBANY

Modern treatment of syphilis. 24: 160, Sept. 22, 1947.

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Wassermann-positive bronchopneumonia during childhood and its various manifestations (Fanconi-Hegglin's syndrome): Contribution to aspects of miliary bronchopneumonia and virus pneumonia. C. Gasser. 2: 185, June 1947. [Abstracted in J. A. M. A., Chicago, 135: 675, Nov. 8, 1947.]

## J. ARKANSAS M. SOC., LITTLE ROCK

Practical considerations in the diagnosis and treatment of neurosyphilis. Ralph W. Grover, Ellis P. Cope and George S. Bozalis. 44: 120-122, Oct. 1947.

## J. IMMUNOL., BALTIMORE

Studies on lymphogranuloma venereum complement-fixing antigens. I. Enhancement by phenol or boiling. Clara Nigg, Maurice R. Hilleman and Betty M. Bowser. 53: 259-268, July 1946.

Studies on lymphogranuloma venereum complement-fixing antigens. II. Serological studies with boiled phenolized antigens. Betty M. Bowser and Clara Nigg. 53: 269-275, July 1946.

Isolation of the virus of lymphogranuloma venereum from twenty-eight patients: relative value of the use of chick embryos and mice. Margaret J. Wall. 54: 59-64, Sept. 1946.

Observations upon the specificity of the complement fixation test for lymphogranuloma venereum. Ann Dean Dulaney and Henry Packer. 55: 53-60, Jan. 1947.

## J. INDIAN M. A., CALCUTTA

Melanoglossia due to penicillin therapy. K. D. Lahiri. 16: 159-160, Feb. 1947.

## J. INDIANA M. A., INDIANAPOLIS

\*Streptomycin. Wallace E. Herrell. 40: 627-630, July 1947.

**Streptomycin.** Wallace E. Herrell. J. Indiana M. A., 40: 627-630, 1947.

In this paper attention is called to the fact that Heilman found that certain spirochetes were sensitive to streptomycin, the drug having been tried in a few cases of early darkfield syphilis. Results were so inconclusive that the author believes that the evaluation of penicillin should continue before the use of streptomycin in syphilis is to be considered.

Following a brief reference to other principal antibiotics, Herrell emphasizes the need of determining the infective

agent and its susceptibilities, then describes its use, pharmacology, methods of administration, etc. The clinical results heretofore obtained with streptomycin in various clinical entities are summarized, its toxicity described, and reference made again to the resistance which organisms will develop.

Reaction following streptomycin by intramuscular, subcutaneous, or intravenous routes is not unlike that of penicillin. Streptomycin diffuses in the body tissues and is excreted fairly readily. Approximately 60 to 80 percent of the amount will be contained in the urine within 24 hours. Levels in the blood are usually highest from 2 to 3 hours following injection. Streptomycin diffuses through the placenta and in fetal circulation. Small amounts will excrete in breast milk so that the nursing infant may receive it. Differing from penicillin, oral administration of even large amounts of streptomycin fails to reach general circulation.

A dosage schedule for general practice, the author states, is simply a matter of deciding on the amount to be used and then giving this amount in 5 to 8 divided doses every 24 hours. A solution for intramuscular administration consists of 1 gm. per 5 cc. distilled water, with an average daily adult dose of approximately 2 gm. and an average child's daily dose of 1 gm. Streptomycin may also be given by nebulization in a solution containing 50 mg. (50,000 units) per cubic centimeter. Pain may occur at the site of injection following subcutaneous or intramuscular administration. Reactions may also occur in a maculopapular rash or generalized urticaria. In cutaneous reactions, benadryl (B-dimethylaminoethyl benzhydryl ether hydrochloride) or pyribenzamine (N'-pyridyl-N'-benzyl-N-dimethyl-ethylene diamine hydrochloride) is recommended as helpful.

A most important toxic reaction encountered in the use of streptomycin imposing a real problem, but not an insurmountable one, is described as the neurotoxic effect on the eighth nerve.

#### **J. KANSAS M. SOC., TOPEKA**

Penicillin and streptomycin—a review of their current uses. Herbert A. Wenner. 48: 261-273, June 1947.

Follow-up procedure on cases and suspected cases found in mass X-ray survey. Hilbert Mark. 48: 451-456, Oct. 1947.

#### **J. M. A. GEORGIA, ATLANTA**

The treatment of syphilis with penicillin in oil-beeswax. Albert Heyman. 36: 277-278, July 1947.

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#### **J. MICHIGAN M. SOC., ST. PAUL**

The fundus oculi in diagnosis and in prognosis. [Including syphilis.] Edmund B. Spaeth. 46: 799-804, 818, July 1947.

Evaluation of the serological test for syphilis. Michigan Postgraduate Clinical Institute. First Annual Meeting—March 12-14, 1947. Arthur C. Curtis. 46: 811, July 1947.

Annual report of Committee on Venereal Disease Control—1946-47. The 82nd annual session, Michigan State Medical Society. Pantlind Hotel-Civic Auditorium, Grand Rapids, September 23-26, 1947.

Committee Reports. 46: 827, July 1947.

Rapid treatment center three years old. 46: 968, Aug. 1947.

#### **J. PEDIAT., ST. LOUIS**

Osseous congenital syphilis: effects of penicillin on rate of healing. Allan J. Hill, Jr., Ralph V. Platou and John T. Kometani. 30: 547-562, May 1947.

#### **J. SOCIAL HYG., NEW YORK**

Is man obsolete? J. R. Heller, Jr. 33: 195-198, May 1947.

Ideals in social hygiene. Alphonse M. Schwitalla. 33: 199-208, May 1947.

The family responsibility in social hygiene. James H. A. Bossard. 33: 209-213, May 1947.

Marriage in the modern world. Bradley Buell. 33: 214-219, May 1947.

#### **LANCET, LONDON**

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#### **M. J. AUSTRALIA, SYDNEY**

Recent developments in neurology in the United States of America. K. B. Noad. 2: 5-8, July 5, 1947.

Congenital syphilis. British Medical Association news. Scientific. 2: 122-125, July 26, 1947.

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Venereal diseases and industrial workers. Notes of the Week. 78: 75, Aug. 17, 1947.

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#### **MIL. SURGEON, WASHINGTON**

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#### **NEW ORLEANS M. & S. J., NEW ORLEANS**

Hoarseness. Its possible implications and its proper management. [Including syphilis.] George J. Taquino. 100: 125-130, Sept. 1947.

#### **NOVA SCOTIA M. BULL., HALIFAX**

Syphilis of the nervous system. Review of cases and treatment of neurosyphilis. F. A. Dunsworth. 26: 236-240, Aug. 1947.

#### **OREGON HEALTH BULL., PORTLAND**

The State Health Officer's responsibility in venereal disease control. Harold M. Erickson. 25: 3-4, June 18, 1947.

State lab ranks high in V. D. tests. 25: 1, June 25, 1947.

Communicable disease. Cases reported for the first time during the week ending Sept. 6, 1947. 25: 2, Sept. 10, 1947.

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Penicillin therapy in early syphilis. C. Huriez and M. Desurmont. 55: 401, June 14, 1947. [Abstracted in J. A. M. A., Chicago, 135: 392, Oct. 11, 1947.]

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60: 232-235, Sept. 1947.

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Roscoe P. Kandle. 28: 364-368, Sept.  
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Chester Keefer. 30: 579-581, Aug. 1947.

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- Aerosol treatment with penicillin and streptomycin. Oscar L. Veach. 44: 816-817, Oct. 1947.

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- Gonococcus infection, urethra. 3: 6-9, Sept. 1947.

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- Simplify the handling of penicillin on the ward. Marie X. Long. 118: 426-427, June 1947.

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Penicillin resistance. Comments on treatment. Harry Beckman. 46: 621, June 1947.  
As it looks to your State Board of Health (Incl. v. d. reporting.) Marshall W. Meyer. 46: 809, Aug. 1947.



### A Note on the Use of Cardiolipin in the Preparation of Indicator (Antigen) for the Hinton Test<sup>1</sup>

Cardiolipin, originated by Pangborn, has been used by Kline, Maltaner, Brown, Rein, their associates, and by Harris as a component of antigen used for the serologic detection of syphilis. Our experience with cardiolipin covers a period of a year during which about 1,000 carefully selected specimens were tested by the Hinton technic with an indicator (antigen) prepared from two samples of cardiolipin and lecithin furnished us by Dr. Mary C. Pangborn, of the New York State Department of Health.

Our results appeared to be just as specific, but considerably more sensitive, than those obtained with the Hinton test

during the past 16 years when the indicator was prepared from extracts of beef heart. The increased sensitivity was obtained not only when titrating serums, but also in testing specimens from known syphilitics.

The test is executed and read precisely as described in "Technics of Serodiagnostic Tests for Syphilis," 1944,<sup>2</sup> except that the stock indicator was prepared from alcoholic solutions of cardiolipin, lecithin, and cholesterol. Our best results were obtained from one of the samples when the proportions were as follows: 0.7 cc. of an alcoholic solution containing 8.92 mg. cardiolipin per cc., 1 cc. of an alcoholic solution containing 30.91 mg. lecithin per cc., and 2.5 cc. of 0.4-percent cholesterol in absolute alcohol, the ratio of cardiolipin to lecithin being approximately 1:5.

In our opinion, the indicator (antigen) prepared with the cardiolipin and lecithin of Pangborn offers the hope of greatly improving the efficiency of the Hinton test for syphilis.

<sup>1</sup> By Genevieve O. Stuart, Assistant Bacteriologist, Wassermann Laboratory, Massachusetts Department of Public Health; James F. Grant, Supervising Technician, Laboratory Department, Boston Dispensary; and William A. Hinton, Chief of Laboratory Department, Boston Dispensary, and of Wassermann Laboratory, Massachusetts Department of Public Health.

<sup>2</sup> Venereal Disease Education Institute, Raleigh, N. C.

### Epidemiologic Activities in Gonorrhea in the District of Columbia Bureau of Venereal Diseases

A review of the epidemiologic activities in the District of Columbia Bureau of Venereal Diseases during the first 6-month period of 1947 showed that a large proportion of epidemiologic investigation was being devoted to contacts to gonorrhea.

After consultation with the United States Public Health Service, it was felt that contact investigation of syphilis should be given priority over other venereal diseases, from the point of view

of general public health. Furthermore, because of limited clerical and other related services, it was decided to eliminate all contact investigation of gonorrhea in order to devote more effort and time to locating and examining contacts to syphilis.

The following procedure was instituted on July 1, 1947. Patients with gonorrhea were, as previously, referred to the public health nurse for interview. This inter-

view was changed from one aimed toward obtaining names of contacts, to one aimed toward educating the individual patient in the symptoms of gonorrhea and toward placing responsibility upon him for referring his contacts to the clinic for examination and treatment. The interview in all cases was individual because of the patient's short stay in the clinic.

As a means of evaluating this procedure, during the first 2 months the patient was requested to give the names of his sexual contacts to the interviewing nurse, and for each of his contacts a referral slip was filled out. This referral form was a 5'' x 8'' mimeographed sheet which listed the various health department venereal disease clinics and the hours at which they were open. After learning the address of the contact, the nurse checked the clinic to which the contact was to report. She also filled in the date by which the contact was to report to the clinic and indicated on the referral slip, in code, the disease of the informant and the date of exposure. A copy of this referral sheet was given to the patient and the original was filed in a pending file. The importance of sending in his own contacts for examination and treatment was emphasized during the interview with the patient. He was then instructed to hand the referral slip to his contact, who was to bring it to the clinic on the first visit.

At the end of the 2-month period, an evaluation of referral slips brought back to the clinics by contacts showed that of the total referral slips given, 23.9 percent were returned to the clinic, as shown in table 1.

TABLE 1.—Disposition of total referral slips for gonorrhea contacts, July 1 to August 31, 1947

	Number		Percent	
Did not report.....	734	-----	76.1	-----
Reported.....	231	-----	23.9	-----
Infected.....	180	-----	18.8	-----
Not infected.....	51	-----	5.1	-----
Total.....	965	-----	100.0	-----

As a comparison with table 1, the results of contact evaluation for 1946 are presented in table 2.

TABLE 2.—Results of contact investigation of gonorrhea, 1946

	Number		Percent	
Located and examined.....	3,830	-----	63.5	-----
Infected.....	2,551	-----	42.2	-----
Not infected.....	1,279	-----	21.3	-----
Insufficient information or unable to locate.....	2,199	-----	36.5	-----
Total.....	6,029	-----	100.0	-----

Undoubtedly, the number of contacts bringing their referral slips back to the clinic is a minimum figure, and it is quite probable that some contacts reported to the clinics but deliberately or carelessly neglected to turn in the referral slip.

Since instituting this procedure, there has been no decrease in the total gonorrhea patients seen in the clinics. It is a frequent occurrence now to have patients who have been interviewed subsequent to July 1, 1947, and who have been reinfected, to return to the clinic accompanied by the sexual partner. This feature is particularly encouraging.

# STATISTICS

## Reported Civilian Venereal Disease Cases and Rates per 100,000 Population, Continental United States, Fiscal Year 1947

Disease and stage	Number of cases reported						
	Total	White			Nonwhite		
		Total	Male	Female	Total	Male	Female
Total syphilis.....	373, 296	149, 461	82, 831	66, 630	223, 835	100, 302	123, 533
Primary or secondary.....	106, 594	46, 492	27, 866	18, 626	60, 102	31, 565	28, 537
Early latent.....	107, 755	31, 493	14, 674	16, 819	76, 262	28, 518	47, 744
Late and late latent.....	122, 257	54, 137	30, 733	23, 404	68, 120	31, 816	36, 304
Congenital.....	12, 284	5, 461	2, 217	3, 244	6, 823	2, 995	3, 828
Stage not reported.....	24, 406	11, 878	7, 341	4, 537	12, 528	5, 408	7, 120
Gonorrhea.....	400, 659	150, 087	97, 758	52, 329	250, 572	168, 967	81, 605
Chaneroid.....	9, 039	2, 086	1, 805	281	6, 953	5, 757	1, 196
Granuloma inguinale.....	2, 403	166	125	41	2, 237	1, 316	921
Lymphogranuloma venereum.....	2, 688	236	188	48	2, 452	1, 864	588
Rates per 100,000 population <sup>1</sup>							
Total syphilis.....	262.8	117.6	131.9	103.7	1, 490.5	1, 369.7	1, 605.6
Primary or secondary.....	75.0	36.6	44.4	29.0	400.2	431.1	370.9
Early latent.....	75.9	24.8	23.4	26.2	507.9	389.4	620.5
Late and late latent.....	86.1	42.6	48.9	36.4	453.6	434.5	471.9
Congenital.....	8.6	4.3	3.5	5.0	45.4	40.9	49.8
Stage not reported.....	17.2	9.3	11.7	7.1	83.4	73.8	92.5
Gonorrhea.....	282.0	118.1	155.7	81.5	1, 668.6	2, 307.3	1, 060.6
Chaneroid.....	6.4	1.6	2.9	.4	46.3	78.6	15.5
Granuloma inguinale.....	1.7	.1	.2	.1	14.9	18.0	12.0
Lymphogranuloma venereum.....	1.9	.2	.3	.1	16.3	25.5	7.6

<sup>1</sup> Civilian population estimated as of April 1947.

Source: Reported cases from Form 8958-B USPHS—Venereal Disease Division, Office of Statistics; population data from Census Bureau Current Population Reports, Series P-20, No. 2, Sept. 9, 1947.







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FEDERAL SECURITY AGENCY  
UNITED STATES PUBLIC HEALTH SERVICE

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**UNITED STATES PUBLIC HEALTH SERVICE**

**THOMAS PARRAN, *Surgeon General***

**Editor: J. R. HELLER, Jr., *Medical Director***  
***Chief, Venereal Disease Division***

**Approved by the Director, Bureau of the Budget, as required by  
Rule 42 of the Joint Committee on Printing**



**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.**  
**Price 10 cents. Subscription price: domestic, 75 cents a year; foreign, \$1.15**



# Family Life, Health, and Social Relations Program in San Francisco

Richard A. Koch, M. D.,<sup>1</sup> and Noel Keys, Ph. D.<sup>2</sup>

## Introduction

The persistent high incidence of the venereal diseases in spite of greatly improved treatment is furnishing increasing evidence that the epidemiologic attack one is insufficient to prevent their read.

Epidemiologists agree that the shortcomings of epidemiologic procedure in the control of venereal diseases are that innumerable infections do not come to the attention of health departments and that the majority of new infections do not come under medical treatment early. Thus, the infected individuals spread their diseases before they are detected, if they are detected at all. Other approaches are needed if venereal diseases are to be effectively repressed in our society.

As one step in the search for these other approaches, a psychiatric service was established at the San Francisco venereal disease clinic, a part of whose function was to determine on a scientific basis the factors motivating sexual promiscuity, if it is a recognized factor in the spread of venereal diseases. The study showed that much of the sexual activity on the part of promiscuous boys and girls and promiscuous young men and women is actually a substitute solution for more appropriate responses to emotional problems which, though not related primarily or directly to sex at all, nevertheless eventuate in sexual promiscuity and hence in venereal disease. Moreover, it became apparent that the disruption of marriage

and family life which results from sexual promiscuity and other forms of sexual maladjustment works an even graver injury to society than do the venereal diseases themselves. In view of these and other considerations, those responsible for venereal disease control in San Francisco decided that the best reinforcement of our epidemiologic attack on venereal diseases would lie in long-range measures of prevention through proper education concerning sex, marriage, family life, and social living in general.

## Development of the Program in San Francisco

Authorities on child development agree that the foundations of emotional behavior patterns are laid in the preschool years. An early aim of our program was, therefore, to encourage parents to give at least as much attention to their children's emotional development as to their physical development. A variety of means was employed to awaken teachers and parents to the needs in this direction.

In 1942, with the assistance of the California Social Hygiene Association, we developed an educational venereal disease control program for labor unions. This emphasized, among other things, the need for sound sex education and healthy emotional development of the child. After 1 year of this work, the labor unions became so interested that they proposed a resolution requesting the schools to include sex education in their curriculums. However, since it was feared that the community at large was not yet prepared for this step, and since teachers were not available for this instruction, we recommended no action at that time.

<sup>1</sup> Chief, Division of Venereal Diseases, City and County of San Francisco Department of Public Health.

<sup>2</sup> Professor of Education, University of California.

The officials of the San Francisco Second District, California Congress of Parents and Teachers, were next consulted, and with their approval a lecture program was conducted for the various local parent-teacher organizations within their district. The lectures were designed merely to arouse parents to their responsibilities and to an awareness of the need for guidance in the emotional education of their children, to give an understanding of the relationship of church and school to this program, and to create a demand for instruction in this field.

By 1944 the parent-teacher association had become so interested that it was decided to attempt a course of instruction cosponsored by a junior high school branch of the Congress of Parents and Teachers, the local school department, and the Department of Public Health. The lectures were given in the evenings for both parents and teachers, and arrangements were made with the school officials to allow these teachers two increment credits for attending. This test program was so enthusiastically received that a physician-specialist was requested to speak on the need of family-life education in home and school at a teachers' institute session in the spring of 1945. There, by a unanimous vote, the teachers requested an in-service training program on the subject. The title "Human Relationships" was chosen as a broad term to cover many topics relating to the normal association between the sexes.

Beginning in October 1945, a series of 10 lectures and discussions on human relationships<sup>3</sup> was presented for parents and teachers, financed by a grant from the Rosenberg Foundation of San Francisco. The cooperating agencies were the Department of Public Health, the city schools, the local parent-teacher organization, and the local social hygiene association. These lectures were offered both in the morning and late afternoon, afford-

ing an opportunity for mothers as well as teachers to attend. The subjects of these lectures were as follows:

Developing Creative Human Relationships: A Need and a Challenge

Understanding Emotional Development: From Infancy to Maturity

Development at Puberty: Boy-Girl Man-Woman

Specific Needs and Interpretations Preschool—As the Twig Is Bent

Specific Needs and Interpretations Preadolescent—Widening Horizons

Specific Needs for Interpretation The Adolescent—Reaching for Maturity

Looking Toward Marriage

Human Reproduction: How Life Begins and Develops

The Schools' Part in Education for Human Relationships

Every Teacher Has a Part

Again arrangements were made for the teachers to be allowed 2 units of increment credit. Five thousand visitors were made to this series of lectures, an average of approximately 350 parents and 150 teachers attending each lecture.

At the conclusion of this series a mimeographed questionnaire was distributed. To the question "Have you found this series of lectures worth while?" the response was 100-percent favorable, and the trend of comments indicated that the course had proved of definite help in finding solutions to immediate emotional and social problems in the family. Ninety-eight percent asked that the course be repeated the next year and that similar courses be given repeatedly. Many believed the subject matter should be available to the adolescents themselves. Another interesting result was that 91 percent opposed shortening the series. When asked "What suggestions do you have to offer for the improvement of the course?" the large majority felt that opportunities should be given for fathers and other men to share, and 93 percent wished the course to be made available to the male members of their own families.

In response to popular demand, the Adult Division of the San Francisco ci-

<sup>3</sup> Nine of these lectures were given by Dr. Bertha Shedd Mason, long the college physician of San Jose State College; and one of the lectures was given by Professor Noel Keys of the University of California.

ools financed a similar series of "human relations" lectures, again in cooperation with the local Department of Public Health, the Congress of Parents and Teachers, the local social hygiene association, and the California State Department of Public Health. This time the lectures were offered in the evening as well, thus affording an opportunity for fathers as well as mothers to attend. The evening lectures had 50-percent male attendance. The subjects were as follows:<sup>4</sup>

- Building Wholesome Family Relations
- Emotional Development—From Infancy to Maturity
- How Life Begins and Develops
- The Preschool Years — Getting Started Right
- The Early School Years—Widening Horizons
- Adolescence—The Between-Age
- Teen-Age Relationships — Stepping Stones to Maturity
- Looking Toward Marriage
- Making Marriage a Success
- Growing Together in a Family

The attendance at this series of 10 lectures increased to 6,000.

Prior to the period during which the local health department was developing the San Francisco community program on human relationships, the University of California had instituted on the Berkeley campus a series of lectures on "Youth and Marriage Today" aimed at preparing the college student for marriage. This was in response to insistent student demand culminating in a formal request from the Associated Students in a special petition called in March of 1939. This course was placed under the direction of Professor Keys. It has now been repeated 30 times on the Berkeley campus and adjacent cities. The lectures are attended by more than 18,000 persons, with students slightly outnumbering the

Eight of these lectures were given by Dr. Martha Shedd Mason, and the two dealing specially with marriage were offered by Professor Noel Keys.

women. This series of lectures has been popularly described under the title of "Sex in the Classroom" (1). An idea of the content may be had from the titles of the lectures offered in the summer of 1947:

- Marriage and the Family in Postwar America
- Love and Conduct in a Changing World
- Sex Problems of Youth and the Unmarried Adult
- Dating, Courtship, and Choice of Life Mate
- The Engagement as Marriage Insurance
- Spiritual Aspects of Marriage
- The Physical Bases of Sex
- The Venereal Diseases
- Role of the Physician in Preparing for Marriage
- Beginning Life Together
- Pregnancy and Childbirth
- Parents and Children
- Psychosexual Differences in Adults
- Making Your Marriage a Success

### Development of Teacher-Training Program

With the growing demand for more adequate instruction in sex and social relations in our public schools and the community at large, it became evident that far too few teachers possessed the needed background in a field of such endless ramifications. In 1946 an advisory committee on family life, health, and social relations,<sup>5</sup> composed of educators,

<sup>5</sup> The following were the members of the advisory committee:

Noel Keys, Ph.D., Professor of Education, University of California, chairman.

Richard A. Koch, M. D., Chief, Division of Venereal Diseases, San Francisco Department of Public Health, secretary-treasurer.

Lawrence Arnstein, Executive Secretary, California Social Hygiene Association.

A. Frank Brewer, M. D., Chief, Bureau of Venereal Diseases, California State Department of Public Health.

Mrs. Rollin Brown, President, California Congress of Parents and Teachers.

Dorothy B. Nyswander, Ph.D., Professor of Public Health Education, University of California.

Edward H. Redford, Coordinator of Adult Education, San Francisco Public Schools.



health workers, and officials of parent-teacher organizations, was formed to explore the possibilities of a summer institute for teacher education concerning sex, marriage, family life, health, and social relationships. Professor Keys was sent on a Federal grant-in-aid scholarship by the California State Department of Public Health to attend the Institute of Health and Human Relations, then in its fourth year of operation at the University of Pennsylvania, under the direction of Dr. John H. Stokes. Following this, plans were formulated for a 6-week intensive program to be known as the Training Center in Family Life, Health, and Social Relations Education to be conducted under Professor Keys' direction at the first summer session of the University of California (Berkeley campus) in 1947. To aid in financing the training center, the committee secured a grant of \$7,500 from the Rosenberg Foundation, which had originally financed the series of lectures on human relations presented in San Francisco. The money was appropriated to publicize the proposed training center, to provide 125 tuition scholarships, and to make possible a follow-up evaluation of the results.

With the approval of the president and regents of the University of California, the training center became a part of the first summer session of 1947 and carried six units of credit.

The daily program was planned to proceed along five coordinated lines of instruction: (1) a course in the nature and direction of emotional development in children, by Frances Bruce Strain, pioneer sex educator and author of numerous books on this subject; (2) an intensive study of the psychology of growth and development, with special reference to the findings of the Berkeley Adolescent Study, which has followed 200 boys and girls from prepuberty to early maturity; (3) the University of California (Berkeley campus) lectures on "Youth and Marriage Today," as previously described, which members of the training center attended as observers; (4) a miscellany of lectures and demonstrations by visiting specialists,

including motion pictures and other aids and materials of instruction; and (5) field trips to demonstrate relations of schools, agencies, public health agencies, parent-teacher organizations, juvenile court and other public agencies. In addition, hours were devoted to work in small discussion groups formed on the basis of special interests of individual members such as college instructors, school nurses, rural high school teachers, and the like.

The training center was publicized by sending printed programs and application blanks to school officials, from junior high school through college level, in the seven Western States. The States included were California, Washington, Oregon, Utah, Idaho, Arizona, and Nevada. All officials were requested to inform the staffs about the coming institute and to nominate those members of their certificated personnel whom they considered best qualified for scholarships. Articles were prepared for the educational publications which would most likely bring the training center to the attention of interested teachers. Each applicant for enrollment or tuition scholarship was requested to submit an application listing in detail previous training, extracurricular and community activities, teaching experience, and the use to which the application expected to put the training received from the course. The advisory committee accepted for scholarships those applicants who by experience, instruction, and nature of their positions would most likely benefit themselves and their local communities through the training.

On the basis of the teaching staff and classroom accommodations available, the enrollment was limited to 125 students on scholarships and 45 additional members or a total of 170 in all. When the committee had completed its difficult task of selecting the 170 to be admitted, it was found that nearly 100 well-qualified applicants had to be refused.

To obtain the benefit of their advice on possible future undertakings, a questionnaire was submitted to 160 members of the training center who completed the strenuous course. Of these, 137 completed

questionnaire. The students were instructed not to sign the questionnaire so that they might feel entirely free to answer the questions frankly.

Of the students replying, 99 percent declared that a similar training center would be held next year, and the same proportion indicated that they would recommend that others attend. Eighty-one percent said they themselves desired more advanced training in this field at some future date. Seventy-nine percent judged the size of the class (170) to be about right. Seventy percent felt that the 6-week full-time program was about the proper duration. However, 12 percent would have had it shorter, and 18 percent favored lengthening it to 8 to 10 weeks. Of special interest is the fact that 92 percent held that family-life education should be included in the basic training of all teachers, and 72 percent thought it should be a required subject for all college students.

Provision has been made for keeping in touch with graduates after they have returned to their positions, and a further questionnaire will be sent in April of 1948 to determine the extent to which they have been able to put into use the knowledge gained.

### Future Local Community Plans

The Division of Venereal Diseases of the San Francisco health department plans to continue to assist the city schools, the local parent-teacher organization, and the social hygiene association in further developing community education in family life, health, and social relations. The director of the Adult Division of the San Francisco city schools has agreed to employ several of the San Francisco members of the University of California Training Center in Family Life, Health, and Social Relations to conduct neighborhood classes on human relationships. Our venereal disease health educator will assist in developing interest in organizing local community groups. It is planned that the subject matter of

these lectures will be similar to material offered previously.

Recently a cooperative conference of the Ministers' Fellowship of the San Francisco Council of Churches and the City and County of San Francisco Department of Public Health was held in order to exchange ideas and to develop a program in the field of family life, health, and social relations. The conference was enthusiastically received by the ministers, and 18 different denominations were represented. The outcome of the conference was the establishment of a permanent Committee on Family Life, Health, and Social Relations of the Health Council of the San Francisco Community Chest. We hope that this committee will be instrumental in furthering such education among church groups. The director of the Adult Division of the San Francisco city schools has also agreed to employ local members of the training center to conduct classes for these church groups. The local community programs will thus be augmented.

### Conclusions

The response of the public, as well as of secondary and collegiate faculty members, to the program in family life, health, and social relations illustrates an increasing awareness of the need to develop educational techniques and methods whereby all the public may be reached. Too long have we been content to allow misinformation and misconception to spread by word of mouth in the alleys and byways of our communities. Too long have parents neglected this important education of children and forced them to secure inadequate and improper sex education from neighboring children. Recent studies indicate that the sex patterns of children are fairly well formulated by the age of 4 or 5 years. These children can be reached only through their parents. Therefore, if the children are to benefit from this education—as they must if we are to develop a better community life—we must reach the par-

ents both before and after their families have been established.

As the furtherance of this educational program is the responsibility of educators, so it is also the responsibility of health workers who are concerned with control of the venereal diseases. For, as has been shown elsewhere, venereal disease is only one of the casualties that result from antisocial or irresponsible social behavior (2).

Public health doctors have now had for a number of years the necessary medical weapons with which to reduce markedly the incidence of venereal disease. Penicillin is perhaps the most ideal medical weapon imaginable in the treatment of gonorrhea. In spite of this great weapon, the incidence of gonorrhea has not as yet

been reduced; in some areas it appears to be on the increase. We who are public health doctors, educators, and nurses must thus look elsewhere for additional weapons. Education appears to be the most likely answer, and specific education in family life, in personal health, and in social relations, if progressively and successfully conducted, should offer future rewards in the reduction of venereal disease.

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## Oklahoma City Case-Finding Demonstration

G. F. Mathews, M. D., Commissioner of Health, Oklahoma State Health Department  
A. B. Colyar, Senior Assistant Surgeon,<sup>1</sup> and John W. Morse, Biostatistician,<sup>2</sup>  
United States Public Health Service

To intensify syphilis case-finding activities in the Oklahoma City area, the State and local health departments, in cooperation with the United States Public Health Service, decided to use the method of mass public information to persuade individuals to obtain a serologic test for syphilis. Previous case-finding demonstrations in other areas had shown that large numbers of persons could be reached in this manner. As a result of the Oklahoma City case-finding demonstration, four times as many cases of previously untreated primary and secondary syphilis

were discovered during the 45-day demonstration as were found in the average 45-day period preceding the project.

In addition to the mass blood-testing appeal to the general population, it was also decided to conduct a special experiment to determine whether persons likely to be infected would accept the offer of a free physical examination after being given an intensive education regarding symptoms and method of transmission of venereal disease. This experiment involved a portion of those persons responding to the general publicity inviting submission to blood tests.

This paper will describe the method used in the project, which ran from April 1 through May 15, 1946, and the result

<sup>1</sup> Venereal Disease Control Officer, Oklahoma State Health Department.

<sup>2</sup> Office of Statistics, Venereal Disease Division.



chieved. In addition, an analysis covering the special experiment in obtaining voluntary physical examination is presented.

## **Methods**

### ***Public Information and Publicity***

Utilizing several modern techniques for the spread of information, a straightforward and extensive appeal to obtain a blood test for syphilis was directed to the general public. Feature articles, editorials, and large advertisements appeared in the local newspapers. Dramatic skits and "spot" announcements were broadcast from local radio stations. Colorful posters were displayed in store windows, on billboards, and on street lamps. The health department obtained cooperation from local civic organizations, which gave active support in providing speakers and opportunities to appear before various groups, in manning information booths erected at busy intersections, and in helping to arrange the blood-testing of school and industrial groups.

### ***Blood-Testing Facilities***

To insure that every person desiring a blood test could get one with relative convenience, special public blood-testing facilities were set up at strategic spots throughout the city. Blood tests could be obtained at the Municipal Building and the USO at any time during the project. In addition to these and to the regular facilities of the health department, blood-testing stations were opened in churches, schools, and industrial plants for short periods, and mobile units, mounted on trailers, moved through the streets to offer tests. The location and schedule of each testing station were well advertised.

### ***Private Physicians' Cooperation***

The participation of the private physicians in Oklahoma City was vital to the

success of the project. The local medical society endorsed the project, and individual physicians participated by drawing blood specimens when requested by patients and acquaintances. There was excellent cooperation between the physician and the health department in the follow-up of persons found to have a positive reaction. Free supplies of penicillin were available to physicians for the treatment of gonorrhea, and the facilities of the Oklahoma Medical Center were available for the treatment of private patients with infectious syphilis.

### ***Record and Laboratory Procedures***

A form showing the name, address, age, race, and sex was prepared in triplicate for each person having a blood test. These forms were numbered serially. Each test tube containing a blood specimen was numbered to correspond with the serial form number of that individual. Forms and blood specimens were forwarded to a special laboratory set up to handle the testing required by the program. The Mazzini test was used, and the results of the test were entered on the three-part form.

### ***Notification and Follow-Up***

Persons with negative blood test results were notified by mail that "test results were essentially negative." The names of persons with positive or doubtful blood test results were checked with the files of cases already known to treatment, and of venereal disease suspects currently under investigation. Persons on whom further tests and examinations were desired were notified by mail that "test results were incomplete," and were requested to report to the health department clinic. Persons failing to report for further examination in response to this letter received a telegram or a visit from a follow-up worker. It was found that telegrams served as a very effective means of second notification. Of 146 persons notified by telegram, 90 (62 percent) responded.

## Results

Table 1 shows the proportionate response of the Oklahoma City population to the appeal to secure a blood test during the 45-day project, by sex, race, and age groups in the population.

A total of 1,923 cases of syphilis was

**Table 1.—Population of Oklahoma City tested for syphilis**

Race, sex, and age	1943 population <sup>1</sup>	Persons tested	
		Number	Percent
Total.....	215,000	48,874	23
White.....	194,000	40,547	21
Male.....	94,000	20,386	22
Female.....	100,000	20,161	20
Nonwhite.....	21,000	8,327	40
Male.....	10,000	4,142	41
Female.....	11,000	4,185	38
Age 15-50.....	129,500	36,100	28
Other age groups.....	85,500	12,774	15

<sup>1</sup> Estimates based on Bureau of the Census data for Oklahoma County, 1940 and 1943, and Oklahoma City, 1940.

identified, of which 865 were previously unknown to the Oklahoma City health department. Of the 865 cases of previously unknown syphilis, 99 were in the primary or secondary stage at the time of diagnosis. In addition, 710 cases of gonorrhea were found and treated during the project. These gonorrhea cases were found in the group accepting an immediate physical examination, among food handlers, and in the group given physical examinations as a consequence of having positive or doubtful blood-test results. Of the blood tests performed satisfactorily, 3 percent were positive and 2 percent were doubtful.

Table 2 shows the results of the initial blood tests and the number and type of infections found.

The success of the project in intensifying the case-finding efforts of the health department is shown in table 3, which compares the number of cases of infectious venereal disease discovered during the project with the number found in periods previous and subsequent to the project. Four times as many cases of

**Table 2.—Over-all results of Oklahoma City venereal disease case-finding demonstration**

	Total	Physical examination facilities available		No physical examination facilities available	
		Total <sup>1</sup>	Examination—		
			Taken		Not taken
Blood test results:					
Persons blood tested.....	48,874	22,673	5,921	16,289	26,20
Total positive, doubtful, and negative test results <sup>2</sup> .....	48,412	22,475	5,813	16,209	25,93
Positive results.....	<sup>3</sup> 1,602	1,125	409	687	47
Doubtful results.....	<sup>4</sup> 1,170	823	290	505	34
Infections found:					
Total venereal disease infections.....	2,633	2,095	1,170	845	53
Gonorrhea.....	710	655	609	9	5
Syphilis.....	1,923	1,440	561	836	48
Known to treatment.....	1,058	837	313	491	22
Not previously known to treatment.....	865	603	248	345	26
Primary.....	44	36	<sup>5</sup> 30	<sup>6</sup> 6	1
Secondary.....	55	48	<sup>5</sup> 37	<sup>6</sup> 11	5
Early latent.....	259	209	85	121	5
Other.....	507	310	96	207	19

<sup>1</sup> Includes 463 food handlers.

<sup>2</sup> Excluding unsatisfactory blood test results.

<sup>3</sup> 3 percent of total positive, doubtful, and negative test results.

<sup>4</sup> 2 percent of total positive, doubtful, and negative test results.

<sup>5</sup> Primary and secondary cases represent 1.1 percent of total persons taking physical examination.

<sup>6</sup> Primary and secondary cases represent 0.1 percent of total persons not taking physical examination.

**Table 3.—Comparison of numbers of previously untreated cases of primary and secondary syphilis and gonorrhea found before, during, and after Oklahoma City case-finding demonstration**

[All data shown are on a 45-day basis]

	Primary and secondary syphilis	Gonorrhea
12 months preceding demonstration (average): April 1945 through March 1946.....	25	256
During demonstration: Apr. 1 through May 15, 1946.....	99	710
12 months after demonstration (average): June 1946 through March 1947.....	48	446

Primary and secondary syphilis were discovered during the project as in the average 45-day period for the year preceding

effectiveness of educational materials—stressing signs, symptoms, and mode of transmission of venereal disease—in influencing persons likely to be infected to accept an immediate physical examination. In the stations where this experiment was carried out, individual testing and examining rooms were provided to insure privacy, and medical interviewers talked with each person having a blood test. The interview covered symptoms of early syphilis and the mode of transmission of venereal disease. Gonorrhea symptoms were also discussed. Informative leaflets, such as the one shown, were given to each person.

Each person was informed of the availability of free physical examination, and those who took advantage of the opportunity went through a concealed passageway to the examining rooms. Figure 1 shows a typical arrangement in blood-

**A Few Pointers About Syphilis**

Syphilis is just like any other disease—the earlier it is found and treated, the easier it can be cured.

A blood test can find syphilis but often there are certain early signs of this disease even before the blood shows a positive test.

The first sign of syphilis (the primary stage) may be a small sore where the germ got into the body.

After the sore has gone, an infected person may have a breaking out on the body and have a sore throat and headache and fever (the secondary stage).

Don't be deceived by the disappearance of these symptoms. They go away without treatment, but the syphilis germs are still in the body and have just begun their harmful work.

These are your warning signs. Keep them in mind—and don't wait until too late for diagnosis.

the project. It is of interest that, on the average, almost twice as many cases of penicillin lesion syphilis were being diagnosed 12 months after the demonstration as were diagnosed before the project.

**Special Experiment**

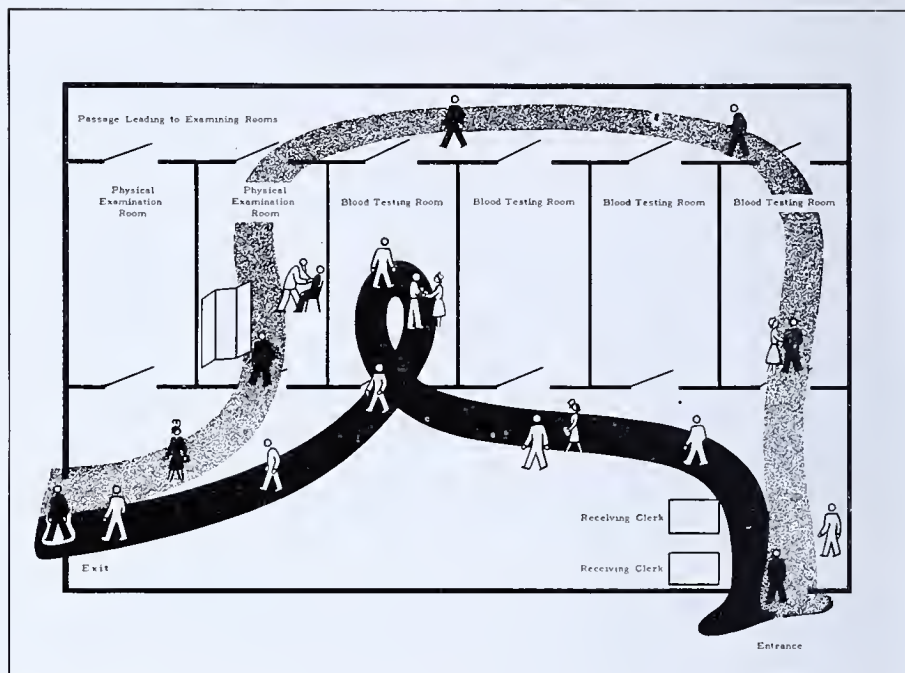
An experiment was made during the project to determine the case-finding ef-

fectiveness of physical examinations where physical examinations were offered.

In general, the places selected to offer physical examinations were located in sections with relatively higher incidence of venereal disease. Thus, the percentage of infection found in the group examined in these places should not be compared with that found in other places where no physical examination was offered.



## SPECIAL BLOOD TESTING AND EXAMINING STATION



Class One Station - Oklahoma City Demonstration

FIGURE 1.

A total of 22,673 persons requested blood tests at stations where physical examinations were available, and of these, 5,921 took advantage of the opportunity for examination. Table 2 compares the findings in the group taking the physical examination with those in the group not taking the examination. The same comparison is shown graphically in figure 2. Even though approximately only one-third as many persons took the examination as did not take it, 4 times as many cases of previously untreated primary and secondary syphilis were found in the examined group. In other words, the percentage of primary and secondary syphilis found among those persons accepting the offer of an examination (1.1 percent) was 11 times the percentage among those refusing the offer (0.1 percent). This is evidence that the educational material succeeded in enabling those persons likely to be infected to recognize the possibility of infection.

Although it was originally planned to

give physical examinations only to those persons who recognized the possibility of being infected, certain departures were made from the original policy in some stations. Because of the ease of performing genital examinations on the male in some stations a majority of all males were persuaded to take the physical examination. Table 4 shows the percentage among race and sex groups, of persons taking physical examinations.

**Table 4.—Proportion among race and sex groups of persons<sup>1</sup> taking physical examinations in stations where such examinations were offered**

Sex	Race		Total
	White	Negro	
	Percent	Percent	Percent
Male.....	35	52	
Female.....	7	24	
Total.....	23	38	

<sup>1</sup> Excluding food handlers.

# OKLAHOMA CITY DEMONSTRATION

RESULTS FOR ONLY THOSE PERSONS OFFERED A PHYSICAL EXAMINATION

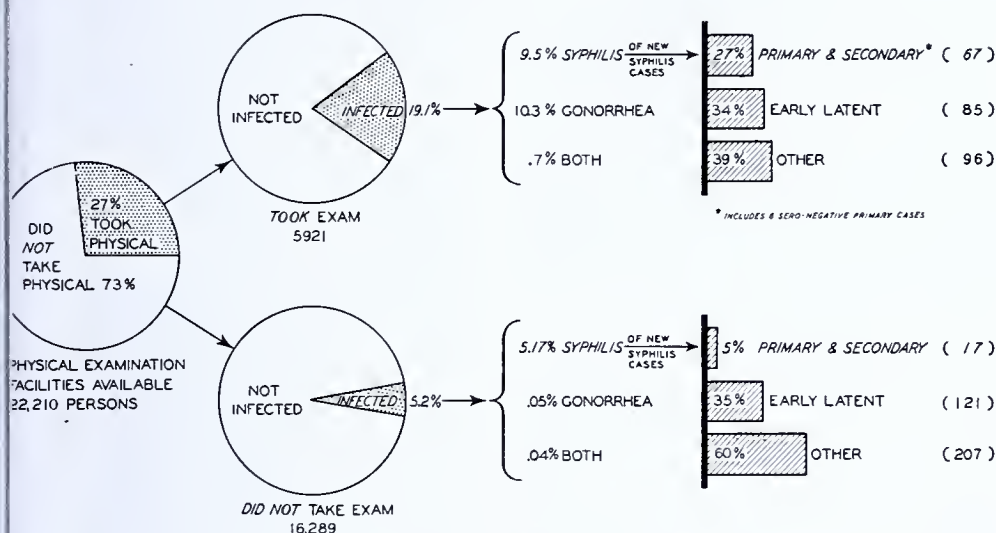


FIGURE 2.

Table 5 compares the results among those taking and those not taking the examination in stations where examinations were offered. To make the groups

more comparable, the six seronegative primary syphilis cases found in the examined group were deducted, since seronegative syphilis could not have been de-

Table 5.—Comparison of results among persons taking physical examination vs. those not taking examination

	Total (including other races and unknown race and sex)		White				Negro			
			Male		Female		Male		Female	
	Examination—		Examination—		Examination—		Examination—		Examination—	
	Taken	Not taken	Taken	Not taken	Taken	Not taken	Taken	Not taken	Taken	Not taken
Number of persons tested:	5,921	16,289	3,285	6,223	522	6,554	1,421	1,334	630	2,034
Percentage having positive and doubtful blood tests:	11.8	7.3	4.1	4.4	10.2	3.9	21.5	20.0	28.9	18.4
Percentage having syphilis (all stages):	19.4	5.17	12.9	3.0	19.0	2.4	18.4	15.0	21.9	13.7
Percentage having syphilis not previously known to treatment:										
Primary	1.4	.04	1.2	.03	1.6	.02	1.8	.07	1.3	.05
Secondary	.6	.07	.1	.03	1.5	.07	.7	0	2.1	.1
Primary and secondary	1.0	.11	1.3	.06	2.1	.09	1.5	.07	2.4	.15
Early latent	1.4	.7	.5	.2	2.5	.4	1.8	1.1	4.1	2.9
Other	1.6	1.3	.5	.8	.6	.6	3.9	4.1	3.0	3.0

Seronegative primary syphilis cases found in the group taking the physical examination are not included.

NOTE: This table shows results for only those persons, excluding food handlers, going to stations where physical examinations were offered.

tested in the group not taking the physical examination. The percentage of infection shown by race and sex indicates a consistently higher percentage of previously untreated primary and secondary syphilis in the examined group: white male, 5 times the proportion found in the group refusing examination; white female, 23 times; Negro male, 21 times; Negro female, 16 times; and for all persons, 9 times. This ratio for all persons is 11 times, when seronegative primary syphilis cases are included.

### Summary and Conclusions

1. Using an intensive campaign of public information, the Oklahoma City health department, in cooperation with the State Health Department and the United States Public Health Service, succeeded in blood-testing 48,874 persons in the Okla-

homa City area in a 45-day period. As a result of this case-finding demonstration 4 times as many cases of primary and secondary syphilis were discovered as were found in the average 45-day period preceding the case-finding demonstration.

2. In a special experiment carried out in some of the blood-testing stations, it was found that intensive educational efforts, stressing the signs and symptoms and mode of transmission of the venereal diseases, can result in raising the individual's level of suspicion so as to persuade those persons likely to be infected to accept a physical examination. This is shown by the fact that of persons receiving this type of education, 11 times as many cases of primary and secondary syphilis, on a percentage basis, were found in persons accepting the offer of physical examination as in persons not accepting this offer.

## The Telegram as a Case-Finding Technic in Venereal Disease Control<sup>1</sup>

Theodore J. Bauer, Senior Surgeon, United States Public Health Service; Amelia H. Baker, M. A.; and M. E. Easterly, M. S.

For 4 years the Venereal Disease Control Program of the Chicago Health Department has effectively used the telegram as a technic in case holding at the Chicago Intensive Treatment Center. The "shock" or "urgency" effect of the telegram quickly returned lapsing patients to the center for observation and examination. Because the low cost and efficiency of the telegram technic in case holding had thus been demonstrated at

the center, it was decided to use the same technic throughout the Epidemiologic Section of the Venereal Disease Control Program as a means of case finding.

Beginning in January 1945, a 6-month study was set up to determine the relative effectiveness of sending telegrams as opposed to field visits in bringing to examination reported contacts of primary and secondary syphilis. Only direct sexual contacts reported by patients treated in the Chicago Intensive Treatment Center for primary and secondary syphilis with complete name and address given on the epidemiologic report, were selected for the study. As a result of this study, it was found that 44 percent of these sus-

<sup>1</sup>From the Venereal Disease Control Program of the Chicago Health Department, in cooperation with the U. S. Public Health Service. Under the direction of Herman N. Bundesen, Senior Surgeon (R) (Inactive), U. S. Public Health Service; President, Chicago Board of Health.



ets came for examination in response to the telegrams as compared to 32.5 per cent reporting in response to an initial visit (1).

The second telegram study, reported here, was conducted for 1 year, from January 1 through December 31, 1946, and was designed (1) to continue testing the effectiveness of sending a telegram as a type of initial epidemiologic activity, and (2) to analyze results of epidemiologic activity by final disposition of the cases. All direct sexual contacts reported by patients with primary or secondary syphilis, with full name and address available on the epidemiologic report, were assigned to this study. The vast majority of the contacts were reported by patients treated by the Chicago Health Department.

The same form of telegram was used in other studies. It was carefully worded so that the reader would not connect its message with a venereal disease clinic. The telegram requested the suspect to report to the office of the director of the Epidemiology Section. The director's office is located in the main building of the Chicago Health Department, where many divisions of the Department are housed in addition to the Venereal Disease Control Program. The fact that there is a branch venereal disease clinic in the same building had bearing on the choice of the reporting place. The exact wording of the telegram, which cost 20 cents, was as follows: "Important you report to Mrs. A. Baker, Fourth Floor, 54 West Hubbard Street, \_\_\_\_\_ (date) (Signed)

erman N. Bundesen, M. D., President, Chicago Board of Health."

The telegram has proved a great time-saving device in case finding, for no more than 2 days elapse between the time the infectious patient is interviewed for contact information and the sending of the telegram to the named suspect. Responses to the telegram are received either on the same day the telegram is sent or on the following day—which, in most instances, is no more than the third day after the original contact interview.

It is interesting to note that of all the persons responding to the telegrams, only three are recorded as having criticized the method of bringing them in to examination. They stated that the telegram created suspicion in the minds of other members of the household.

All persons responding by telephone to the telegrams were requested to report in person at the place designated. The existing policy of the Chicago Health Department is to give no information concerning venereal disease reports or examinations in a telephone conversation because of the impossibility of proper identification of the caller. This policy was established in compliance with the municipal code of the City of Chicago, which provides that all records in the Chicago Health Department concerning venereal disease examinations or reports are confidential and may not be divulged to anyone except upon the written consent of the person involved.

Table 1 shows the results of the second study. Named sexual contacts with full name and address on epidemiologic reports during this period, January 1 through December 31, 1946, totaled 1,541, which was 63 percent of the total number of named contacts reported by patients with primary and secondary syphilis.

**Table 1.—Number of primary and secondary syphilis contacts sent telegrams from January 1 through December 31, 1946, grouped by response to telegrams**

Response to telegrams	Contacts	
	Number	Percent
Total number sent telegrams..	1, 541	100. 0
Number responding to telegrams.....	725	47. 0
Without subsequent field work.....	653	42. 3
Necessitating subsequent field work.....	72	4. 7
Number not responding to telegrams.....	816	53. 0
Delivered.....	496	32. 2
Not delivered and returned to Chicago Health Department.....	320	20. 8

Of the total number of suspects responding to the telegrams, 72 reported for examination but later failed to return to the clinic for further observation, which necessitated field follow-up to complete the diagnoses and to make a final disposition of the cases.

It should be pointed out that of the telegrams sent, only 1,221 were actually delivered. Of the suspects who received telegrams, 59.4 percent reported as directed. When the Epidemiology Section received notification from the telegraph company that a telegram could not be delivered, the informant was reinterviewed, if he was a patient in the Chicago Intensive Treatment Center, for further information on the contact. Whether or not additional information was obtained on reinterview, the case was immediately assigned to the field.

The 320 undelivered telegrams were returned to the Epidemiology Section by the telegraph company. Reasons for failure to deliver were reported by the telegraph company as "unknown at this address," "no such number," or "moved, left no forwarding address."

In 496 cases telegrams were delivered but no responses were received within 3 days following dispatch of the telegrams. The cases were then assigned for field investigation.

Table 2 presents the final disposition of the cases closed following all epidemiologic activity.

Epidemiologic activity was considered

**Table 2.—Number of primary and secondary syphilis contacts sent telegrams, grouped by disposition following epidemiologic activity**

Disposition following epidemiologic activity	Contacts	
	Number	Percent
Examined—not infected.....	467	30.3
Placed under treatment.....	402	26.1
Already under treatment.....	139	9.0
Out of jurisdiction.....	113	7.3
Not located.....	370	24.0
Other.....	50	3.3
Total.....	1,541	100.0

successful when the case was closed a "examined—not infected," "placed under treatment," or "already under treatment." Cases located and closed in one of these three categories were 65.4 percent of the total number of cases assigned to the study.

As far as epidemiologic activity is concerned, "out of jurisdiction" is not considered an unsatisfactory closing. Thus since the "out of jurisdiction" closings were 7.3 percent of the total cases, the unsatisfactory closings in this study were only 27.3 percent.

The closings "not located" and "other" are considered unsatisfactory, although "other" includes such dispositions as "died," "falsification admitted on part of informant," etc.

Table 3 presents the final disposition of the cases assigned to field investigation. These cases include the 496 contacts who did not respond to telegrams, 72 who responded to the telegram but did not complete observation without a field follow up, and 320 instances in which telegram were not delivered.

**Table 3.—Number of primary and secondary syphilis contacts assigned for field investigation after telegram failure, grouped by disposition following epidemiologic activity**

Disposition following epidemiologic activity	Contacts sent telegram		
	Total	Delivered	Not delivered
Examined—not infected.....	170	126	
Placed under treatment.....	157	131	
Already under treatment.....	63	51	
Out of jurisdiction.....	86	59	
Not located.....	370	161	209
Other.....	42	40	
Total.....	888	568	320

Study of table 3 reveals the fact that of the telegrams returned undelivered it was possible by field investigation to locate and close successfully 25.7 percent of the cases. If we add the group "out of jurisdiction," satisfactory dispositions may be counted as 34.1 percent.

As a corollary to the telegram study, table 4 shows the diagnoses in the group found to be infected and placed under treatment. This analysis was to determine to what extent epidemiologic activity in a venereal disease control program actually finds and places under treatment cases of infectious syphilis.

It will be noted that table 4 shows a total of 225 cases of primary and secondary syphilis found and placed under treatment, which approximates 1 in 7 of the total number of cases to which telegrams were sent. The addition of 131 early latent cases which were found upon examination brings the ratio of infectious or potentially infectious syphilitics located and placed under treatment to 23.1 percent of the 1,541 contacts in the study.

Table 4.—Number of primary and secondary syphilis contacts placed under treatment, grouped by diagnosis of contact and of informant

Diagnosis of contact	Total	Diagnosis of informant	
		Primary	Secondary
Syphilis:			
Primary.....	64	17	47
Secondary.....	161	54	107
Early latent.....	131	43	88
Late latent.....	38	3	35
Cardiovascular.....	2	1	1
Neurosyphilis.....	1	0	1
Congenital.....	3	0	3
Unclassified.....	2	1	1
Total.....	402	119	283

Table 5 indicates the diagnoses on those "already under treatment." This category includes persons receiving treatment for syphilis at the time of report, either from a private physician or clinic or from a Chicago Health Department clinic.

If we assume that the group of those cases not examined, which is included in the categories "not located," "out of jurisdiction," and "other" closings, is infected in the same ratio as the group of those "placed under treatment" and "al-

Table 5.—Number of primary and secondary syphilis contacts already under treatment, grouped by diagnosis of contact and of informant

Diagnosis of contact	Total	Diagnosis of informant	
		Primary	Secondary
Syphilis:			
Primary.....	22	2	20
Secondary.....	40	9	31
Early latent.....	33	4	29
Late latent.....	40	5	35
Congenital.....	2	1	1
Unclassified.....	2	1	1
Total.....	139	22	117

ready under treatment," then it would appear that 44.7 percent of contacts of primary and secondary syphilis, reported with complete information as to name and address, are infected with primary, secondary, or early latent syphilis, and 9 percent are infected with late latent or other syphilis.

It would follow, then, that the direct, sexual contacts of acute infectious syphilis not infected would be as high as 46.3 percent. Furthermore, the quarterly Statistical Letter of the Office of Statistics, Venereal Disease Division, United States Public Health Service, shows in epidemiologic evaluation reports of a number of areas that the percentage of examined contacts found not to be infected ranges from about 40 percent to 70 percent, with an average of about 50 percent. This percentage of noninfection is particularly interesting in view of figures in other and earlier studies which have shown the percentages of contacts of infectious syphilis escaping infections as considerably lower. Dr. Rudolph H. Kampmeier, in his book, *Essentials of Syphilology* (2), reported that in the Vanderbilt University Hospital Syphilis Clinic "about 25 percent of contacts of acute cases of syphilis escaped infection."

A grouping by age, sex, and marital status of contacts in the present study is shown in tables 6 and 7.



**Table 6.—Number of primary and secondary syphilis contacts sent telegrams, grouped by age and sex**

Age in years	Sex		
	Total	Male	Female
17-19.....	181	50	131
20-24.....	543	243	300
25-29.....	376	239	137
30-34.....	188	126	62
35 and over.....	162	121	41
Unknown age.....	91	59	32
Total.....	1,541	838	703

**Table 7.—Number of primary and secondary syphilis contacts sent telegrams, grouped by response to telegrams, and marital status**

Marital status	Contacts sent telegrams					
	Total		Responding		Not responding	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Married.....	439	100.0	262	59.7	177	40.3
Single.....	762	100.0	328	43.0	434	57.0
Unknown.....	340	100.0	135	39.7	205	60.3
Total.....	1,541	100.0	725	47.0	816	53.0

Table 7 shows the contacts grouped by their marital status as reported by the informants. Of the 439 contacts reported as married, 59.7 percent responded to the telegrams. Of the contacts reported as single, 43 percent responded; and in the "unknown" group, 39.7 percent responded. The significant difference between the responses of the married and single groups

might be influenced by the fact that many of the contacts reported as married were spouses of the informants.

**Summary**

The gratifying response to telegrams used in case holding at the Chicago Intensive Treatment Center, and the favorable results of the 1945 study in case finding by the Epidemiology Section of the Chicago Venereal Disease Control Program, prompted the present study.

During the calendar year 1946, telegrams were sent to direct sexual contacts of primary and secondary syphilis cases when complete name and address were given by the informant.

Of 1,541 contacts to whom telegrams were sent, 725 contacts, or 47.0 percent, reported to the Health Department within 3 days.

A total of 225 contacts was placed under treatment for primary or secondary syphilis, or 1 out of every 7 persons to whom telegrams were sent.

The telegram technic is inexpensive, and proved unobjectionable to the contacts. It is effective and time-saving.

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# Treatment of Chancroid With Streptomycin<sup>1</sup>

Harold L. Hirsh, M. D., and S. Ross Taggart, M. D.

Sulfonamides have been considered to be almost specific in the treatment of chancroid. Although the Ducrey bacillus belongs to the group of organisms thought not to be sensitive to penicillin, Tung and Razier (1) and Mortara et al. (2) found that several strains of this bacterium were relatively susceptible to penicillin in vitro; and there are several reports (3, 4, 5) on its effectiveness clinically. Day (3) employed the drug with good results in a patient who was sensitive to sulfathiazole. Mortara and Saito (6) found that all the strains of *Hemophilus ducreyi* that they tested were remarkably sensitive to streptomycin. The *H. ducreyi* is thus unusual in that it is susceptible to the action of sulfonamides, penicillin, and streptomycin.

Although streptomycin has been used successfully both prophylactically and therapeutically in the treatment of experimentally produced chancroid lesions (7), there have been no reports on its use clinically. This is a report of the use of streptomycin in the treatment of chancroid, as carried out at the rapid treatment center in Gallinger Municipal Hospital.

## Clinical Data

Treatment with streptomycin has been completed in 15 patients. There was no selection of patients, and therapy was instituted as soon as diagnosis was made. In all patients the diagnosis was established on the basis of a positive culture inoculated with a swab of the lesions or

pus aspirated from a bubo, or identification of organisms morphologically resembling the Ducrey bacillus from smears (Pappenheim's stain) of the same material, plus a positive Ducrey skin test. Because our supply of streptomycin was limited, all patients except one were given 1 gm. of streptomycin per day in divided doses every 4 hours intramuscularly. The one patient received a daily dose of 2 gm. The pertinent details are shown in table 1.

All but one of the patients were Negroes. There were 13 males and 2 females. The ages ranged from 19 to 47 years. Of the male patients 10 had penile lesions, 2 had buboes, and 1 had both types of lesions. Most of the patients with involvement of the penis had multiple ulcers. Both female patients had ulcerations of the labia. The lesions in all the patients had been present for periods from 7 days to 3 months prior to admission. Two of the patients had previously received sulfonamides, 1 had penicillin, and 1 had both drugs—all without improvement.

Streptomycin therapy was continued until the lesions showed evidence of complete healing. The duration of treatment ranged from 5 to 25 days. When there were large or multiple penile lesions, or lesions that were apposed or covered by skin, healing was slower and treatment was prolonged. Recovery was facilitated if the buboes were aspirated as they became distended. No more than two aspirations were necessary after treatment was started. These were done during the first few days of therapy, as after that time there was no reaccumulation of pus. The follow-up for this series of patients covers periods up to 7 months. No evidence of streptomycin toxicity was observed in any of the patients.

<sup>1</sup>From the Venereal Disease Rapid Treatment Center, Gallinger Municipal Hospital, and the Bureau of Venereal Diseases, District of Columbia Health Department, Washington, D. C.

**Table 1.—Clinical data on 15 patients treated for chancroid with streptomycin**

Patient	Age	Sex	Color	Lesion	Duration of lesion (days)	Previous therapy	Streptomycin (grams or days)	Follow-up (weeks)
1	25	M	Negro	Bubo	21	Penicillin	5	1 30
2	43	F	do	Ulcer of labia minora	30	Penicillin Sulfadiazine	( <sup>2</sup> ) } 28	
3	24	M	do	Penile ulcers	7	None	15	8
4	24	M	do	do	7	do	11	5
5	23	M	do	Penile ulcer	10	do	8	5
6	42	F	do	Ulcer of labia minora	( <sup>3</sup> )	do	15	4
7	19	M	do	Penile ulcer	30	Sulfadiazine	10	3½
8	20	M	do	Penile ulcers	90	Sulfadiazine	19	3½
9	23	M	do	Penile ulcer	10	None	12	3
10	26	M	do	Penile ulcers, bubo	21	do	11	2
11	47	M	do	Penile ulcers	14	do	11	2
12	21	M	do	Penile ulcer	21	do	7	1½
13	31	M	do	Penile ulcers	21	do	11	1
14	34	M	White	do	21	do	25	1
15	30	M	Negro	Bubo	14	do	14	1

<sup>1</sup> Possible relapse 6 weeks after streptomycin was discontinued; re-treated successfully with sulfadiazine.

<sup>2</sup> 24 gm. in 12 days.

<sup>3</sup> Unknown.

### Case Reports

The case histories of the first two patients treated in this series are reported in detail, as they are illustrative of our experiences.

*Patient 1.*—A Negro male, age 25, was admitted because of a recurrent bubo of the left inguinal area which had been present for 3 weeks. For 12 days prior to admission he had been receiving 300,000 units of penicillin in oil and wax twice a day without effect. The Ducrey skin test was markedly positive, and the Frei test and repeated serologic tests for syphilis were negative. The bubo was aspirated and the pus cultured on brain-heart infusion broth with 1 percent rabbit's blood. The Ducrey bacillus was identified after 48 hours' incubation at 35° C. The patient was then placed on a regime of 1 gm. of streptomycin a day, in equally divided doses at 4-hour intervals. Within 24 hours there was marked improvement in the bubo. On the fifth day there was apparently complete healing, at which time the drug was discontinued. Six weeks later the patient was readmitted with fever, a penile ulcer, and recurrence of the left bubo. Since his discharge from the hospital, he had had contact with a

patient who was known to have secondary syphilis. Darkfield examinations, smears and cultures of the ulcer, the Frei test, and repeated serologic tests for syphilis were negative. The Ducrey skin test was found to be positive. He was placed on a regime of 1 gm. of sulfadiazine 4 times a day for 7 days, with prompt subsidence of the fever and bubo, and complete healing of the ulcer. He has had serologic tests for syphilis at 2-week intervals, and at the end of 7 months his blood serology remains negative.

*Patient 2.*—A Negro female, age 43, was admitted because of the presence of multiple, irregular, slightly indurated, crateriform ulcers of the labia minora. The Ducrey skin test was positive and the Frei test was negative. On the basis of serologic tests for syphilis, a diagnosis of late latent syphilis was made. The patient was given penicillin in doses of 16,667 units every 2 hours intramuscularly for 12 days for a total dose of 2,400,000 units. At the conclusion of therapy there was no evidence of improvement in the ulcers. She was then given 1 gm. of sulfadiazine 4 times a day for 8 days without any change in the lesions. Smears and cultures of the lesions at this time re-



vealed organisms morphologically resembling Ducrey bacilli on the smears stained with Pappenheim's reagent. Streptomycin was then started in doses of 2 gm. per day intramuscularly, equally divided at 4-hour intervals. Within 48 hours the lesions were markedly improved, and at the end of 12 days of therapy they were completely healed. She has now been followed for 7 months without any evidence of relapse.

### Comment

Sulfonamides are undoubtedly the drugs of choice in the treatment of chancroid because of the lower cost and simplicity of administration. When the patient is sensitive to the sulfonamides or when the infection is resistant to these drugs, penicillin or streptomycin may be used.

The *H. ducreyi* appears to be sensitive to penicillin in vitro (1, 2). It has not been possible, however, consistently to confirm the in vitro results by in vivo experiments and with clinical results. Pereyra and Landy (8) found that doses of 5,000 to 10,000 units of penicillin every 3 hours intramuscularly proved ineffective. One of our patients failed to be cured after receiving 300,000 units of penicillin in oil and wax twice a day for 12 days; and the other failed after being given aqueous penicillin in doses of 16,667 units every 2 hours intramuscularly for a total of 2,400,000 units (12 days). Norcross (9) noted that in 34 patients with syphilis and chancroid treated with 60 doses of 40,000 units of penicillin every 3 hours, there was no improvement in the chancroid lesions. The explanation for the failure of penicillin in some cases of chancroid may be that the causative organism was a relatively resistant strain. Although some strains of the Ducrey bacillus will apparently respond to relatively larger amounts of penicillin, it may not be possible to achieve, with present methods of administration, bactericidal levels of penicillin for other strains of the organism.

In such cases streptomycin may be employed, since the Ducrey bacillus is highly susceptible to this drug. On the basis of in vitro and in vivo studies and the results in these 15 cases, it appears that doses of only 1 gm. per day for relatively short periods of time (7 to 25 days) are sufficient. The development of a possible relapse in our first patient would make it prudent to treat patients for longer than 5 days. In this patient, treatment had been discontinued shortly after the bubo had subsided. Subsequent experience, in which treatment was continued for several days after the lesions appeared to be healed, has resulted in recoveries which are apparently maintained.

It should be remembered that 12 of the patients in this series did not receive sulfonamides prior to streptomycin. It is quite likely that they would have responded to this form of therapy, but streptomycin was used in order to gain experience with this antibiotic in the treatment of chancroid.

### Summary

Fifteen cases of chancroid which illustrate the usefulness of streptomycin are presented. The relative value of the sulfonamides, penicillin, and streptomycin in the treatment of this venereal disease is discussed.

### Acknowledgment

The authors wish to thank Drs. Gordon M. Smith, Franklin D. Hendricks, Jay A. Robinson, and Jean J. Vivino for their cooperation in the completion of these studies, and Misses Myrtle Myers and Joan Rowe for technical assistance.

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### Addendum

Since this report was written, 11 additional patients have been treated with streptomycin for chancroid, all with good results at this period of follow-up.

The period of posttreatment observation has lengthened by 15 weeks for the patients listed in table 1.

## CURRENT LITERATURE

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NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of all articles concerned with venereal diseases or related subjects which have been published in the better known journals both here and abroad during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

### AM. J. M. SC., PHILADELPHIA

\*The serologic response following penicillin therapy for early syphilis. E. Gurney Clark, R. W. Maxwell and Virgil Scott. 213: 535-548, May 1947.

**The serologic response following penicillin therapy for early syphilis.** E. Gurney Clark, R. W. Maxwell and Virgil Scott. Am. J. M. Sc., 213: 535-548, 1947.

Therapeutic efficacy, as shown by serologic cure, is discussed as being determined over a long period of time by the absence of clinical and/or serologic relapse, seroresistance, and late progression

in large numbers of patients observed for a minimum of probably 5 years.

In early syphilis, however, immediate indicators exist which permit preliminary evaluation in shorter time; these include the disappearance of *Treponema pallidum* from lesions, the healing of lesions, quantitative serologic response, and the outcome of pregnancy in syphilitic women.

It is the purpose of this paper to compare the serologic response following penicillin therapy with that following previously established methods. Two hundred and eight patients with untreated primary or secondary syphilis were hos-

hospitalized for treatment with penicillin between September 28, 1943, and December 1, 1945. Diagnosis was confirmed by larkfield positive demonstration of *T. pallidum* in addition to a Kahn quantitative blood test and cerebrospinal fluid examination. Penicillin was administered to approximately 90 percent of these patients as follows: (1) 1.2 million Oxford units in 3¼ days; (2) 1.6 million Oxford units in 10 days; and (3) 4.8 million Oxford units in 7½ days.

The results are presented in detail in tables and graphs. The serologic response observed during the first 8 weeks of arsenical therapy was found comparable to that following penicillin. However, when these serologic responses were compared by stage of disease, the response following penicillin for seropositive primary syphilis was noted to be slightly less prompt over this time-period than that recorded during arsenical treatment. This retardation in the rate of fall of serum reagin was also found in early secondary and late secondary syphilitic infection.

Also noted was the linear relationship between duration of infection and the rate of fall of serum reagin, i. e., the longer the duration of the disease the slower was the serologic response. A determination of the serologic response by age, race, and sex showed the greatest delay in rate of fall of serum reagin to be in Negro females and in the group of persons under 20 years of age.

AM. J. MED., NEW YORK

Destructive osseous lesions in early syphilis. Response following penicillin therapy. Case report. Robert J. Glaser and Virgil Scott. 3: 496-500, Oct. 1947.

AM. J. OBST. & GYN., ST. LOUIS

\*Absorption of penicillin from the vagina. Morris A. Goldberger, Robert I. Walter and Louis S. Lapid. 53: 529-531, Mar. 1947.

**Absorption of penicillin from the vagina.** Morris A. Goldberger, Robert I. Walter and Louis S. Lapid. Am. J. Obst. & Gynec., 53: 529-531, 1947.

The writers herein report on the blood

levels and urinary excretion of penicillin following the administration of single large doses by the vaginal route. No information on this method is to be found in the available literature, it is stated.

Ten patients were selected, of whom seven were normal, menstruating women, two were postmenopausal, and one had amenorrhea associated with virilism.

After a vaginal douche of sterile water, 5 suppositories, each containing 100,000 units of calcium penicillin in a base of cocoa butter, were placed in the vagina. A modification of the Rammelkamp method was used to determine the level of penicillin in the blood, while urinary excretion studies were done for 24 hours after treatment.

Following the intravaginal administration of 500,000 Oxford units of penicillin, the average penicillin level in the blood was found to be 0.38 units per cubic centimeter of serum at the end of 30 minutes; 1.35 units per cubic centimeter at the end of 1 hour; 0.96 units per cubic centimeter at the end of 2 hours; and 0.38 units per cubic centimeter at the end of 3 hours. Therapeutic levels were maintained up to 3 hours in all cases. Wide individual variations, probably due to loss of penicillin from the introitus, were observed. The total urinary excretion of penicillin in 24 hours varied from 33,425 units to 142,000 units, the average being 91,957 units. No untoward local or systemic toxic effects were observed.

Since it was demonstrated in this study that penicillin is readily absorbed through the vaginal mucosa and appears in the blood in high therapeutic levels, the authors claim that this method warrants further clinical trial which may prove it to be the method of choice for the administration of penicillin in women.

ANN. INT. MED., LANCASTER

\*Penicillin in the treatment of neurosyphilis. IV. Cerebrospinal fluid changes in cases of symptomatic neurosyphilis. Frank W. Reynolds. 26: 393-404, Mar. 1947.

Dissecting aneurysm of the aorta: a presentation of fifteen cases and a review of the recent literature. S. Richard Bauersfeld. 26: 873-889, June 1947.



**Penicillin in the treatment of neurosyphilis. IV. Cerebrospinal fluid changes in cases of symptomatic neurosyphilis.** Frank W. Reynolds. *Ann. Int. Med.*, 26: 393-404, 1947.

Referring to the study of the effect of penicillin in various forms of neurosyphilis begun at Johns Hopkins Hospital in October 1943, the author deals in this paper with the changes in cerebrospinal fluid abnormalities in various types of symptomatic neurosyphilis. Pointed out is the difficulty in determining the proportion of neurologic or psychiatric abnormality due to treatment failure and the proportion due to irrevocable pretreatment tissue destruction, since neural tissue once destroyed does not regenerate.

This report is based on 149 patients with neurosyphilis treated with penicillin as of January 1946. This group included patients with general paresis, taboparesis, tabes dorsalis, primary optic atrophy, meningovascular neurosyphilis, and Erb's syphilitic spastic paraplegia. Penicillin alone, in amounts ranging from 2.0 to 10.0 million units, was administered to 111 patients, while the remaining 38 received from 2.0 to 6.0 million units of penicillin concurrently with malaria. The group, consisting of 84 white and 65 Negro patients, had a mean age of 43.6 years, the youngest being 10 and the eldest 79 years of age. The majority of patients had group III spinal fluids, with increased cell count, elevated spinal fluid protein, strongly positive Wassermann reactions, and "first zone" colloidal mastic tests.

The over-all effect of treatment of the spinal fluid abnormalities of the group is shown in detail in graphic form. Improvement in these abnormalities was generally apparent, the cell count and total proteins promptly becoming and remaining normal. Colloidal mastic and Wassermann tests gradually attained an improvement which was well sustained.

It was seen in this study that penicillin and malaria brought about more striking spinal fluid response than penicillin alone. In the colloidal mastic test and

the Wassermann titer of the spinal fluid especially, was there evidence that concurrent penicillin-malaria is superior to penicillin alone.

**J. AM. PHARM. A. (PRAC. PHARM. ED.)**  
**WASHINGTON**

Tablets buffered penicillin. NNR. Products recently accepted by the A. M. A. Council on Pharmacy and Chemistry. 8331, June 1947. At the 93rd A. Ph. A. Convention. [Pharmacy and v. d.], 8484-497, Oct. 1947.

**J. EXPER. MED., BALTIMORE**

\*Relation of the size of the inoculum and the age of the infection to the curative dose of penicillin in experimental syphilis, with particular reference to the feasibility of its prophylactic use. Harry Eagle, H. J. Magnuson and Ralph Fleischman. 85: 423-440, Apr. 1, 1947.

**Relation of the size of the inoculum and the age of the infection to the curative dose of penicillin in experimental syphilis, with particular reference to the feasibility of its prophylactic use.** Harry Eagle, H. J. Magnuson and Ralph Fleischman. *J. Exper. Med.*, 85: 423-440, 1947.

In this paper on experimental rabbit syphilis, the authors show that if rabbits are inoculated with varying numbers of organisms, there is a corresponding variation in the amount of penicillin needed to abort the infection when administered 4 days after inoculation, and that if the size of the inoculum is fixed, there is a progressive increase in the amount of penicillin necessary to abort the infection when the animals are treated at varying intervals after their inoculation. The most favorable situation, therefore, is a small inoculum followed by treatment during the incubation period, before the organisms have significantly multiplied.

There were two aspects to this study: (1) the relation of the size of the inoculum to the abortive dose of penicillin; and (2) the relation of the age of the infection and the site of inoculation to the abortive dose of penicillin. In the first phase of the investigation it was found that the abortive dose varied with the size of the inoculum. In animals inoculated intracutaneously with 20, 2,000, and

00,000 spirochetes, and treated 4 days later, the dose of penicillin required to protect half the animals was 200, 500, and 500 units per kilogram, respectively, while the corresponding PD<sub>50</sub> dosages were 500, 2,000, and 16,000 units per kilogram. The penicillin was administered as a single intramuscular injection in peanut oil and beeswax.

In the second phase of the study, when fixed intratesticular inoculation was used, the amount of penicillin necessary to prevent infection in half the animals remained at a constant level for 4 days. By the end of the second week, more than 10 times this dosage was needed to protect the animals, and by the sixth week, after the chancre had appeared, more than 30 times this amount was necessary. Similar results were obtained when the rabbits were inoculated intracutaneously.

The authors discuss the prophylactic use of penicillin in syphilis. Since it was seen that nearly all rabbits inoculated with 20 organisms and treated 4 days later with 500 units of penicillin per kilogram were protected, and that even with an inoculum of 2,000 spirochetes, this dosage protected half the animals, the possibility of aborting syphilis in man by small doses of penicillin administered during the incubation period was suggested. Assuming that penicillin behaves similarly in human and in rabbit syphilis, a total of from 15,000 to 50,000 units in the average adult might therefore be expected to abort some early infections if given 4 days after exposure. If it is found that the natural disease in man is caused by the penetration of small numbers of spirochetes, then abortion might be brought about by doses of penicillin so small that a single injection or tablets by mouth, given as long as several days after exposure, might prove effective, according to the authors.

#### **F. FLORIDA M. A., JACKSONVILLE**

Newer services of the State laboratories.  
Albert V. Hardy. 34: 276-280, Nov. 1947.

#### **T. TENNESSEE M. A., NASHVILLE**

Ringlike skin lesions. [Including syphilis.]  
Clarence Shaw. 40: 330-331, Oct. 1947.

#### **M. J. AUSTRALIA, SYDNEY**

Medical aspects of the selection and care of blood donors. Lucy M. Bryce. 2: 415-420, Oct. 4, 1947.

The compulsory premarital serological test for syphilis. H. F. Hustler. Correspondence. 2: 437-438, Oct. 4, 1947.

#### **M. OFFICER, LONDON**

The incidence of neurosis. Editorial. 78: 177, Oct. 25, 1947.

#### **MIL. SURGEON, WASHINGTON**

Penicillin in syphilis. Association Notes. 101: 347, Oct. 1947.

#### **NEW ENGLAND J. MED., BOSTON**

Streptomycin therapy for certain infections of intestinal origin. Edwin J. Pulaski and William H. Amspacher. 237: 419-428, Sept. 18, 1947.

Streptomycin therapy in 52 cases of bacterial infection. Lewis W. Kane and George E. Foley. 237: 531-540, Oct. 9, 1947.

Granuloma inguinale with perianal involvement. Report of a case. Joseph Berkowitz. 237: 665-667, Oct. 30, 1947.

Aerosol therapy of respiratory disease. A report of fifty cases. Vernon Bryson and Edwin J. Grace. 237: 683-692, Nov. 6, 1947.

Services offered to the physician by the Massachusetts Department of Public Health. [Including v. d.] Vlado A. Getting. 237: 693-698, Nov. 6, 1947.

#### **NORTHWEST MED., SEATTLE**

Pancreatic and liver function. [Syphilis.] Armand J. Quick. Original Articles. 46: 762-764, Oct. 1947.

#### **PENNSYLVANIA M. J., HARRISBURG**

The intensive treatment of early syphilis. An evaluation of penicillin therapy combined with arsenical and heavy metal. Bernhard A. Goldmann, Townsend W. Baer and Saul R. Bergad. 50: 1149-1154, Aug. 1947.

Penicillin in the treatment of syphilis. Venereal Disease Notes. E. S. Everhart. 50: 1160, Aug. 1947.

Commission on the Control of Syphilis and Venereal Disease. Official Transactions. Ninety-Seventh Annual Session. Pittsburgh, Pa., September 15 to 18, 1947. 50: 1237, Aug. 1947.

Penicillin treatment of the syphilitic pregnant woman. Venereal Disease Notes from the Pennsylvania Department of Health. 50: 1376, Sept. 1947.

Venereal diseases. Edgar S. Everhart. Venereal Disease Notes. 51: 67, Oct. 1947.

TEXAS STATE J. MED., FORT WORTH  
Tumors of the larynx. (Incl. syphilis.)  
Oliver W. Suchs. 43: 393-397, Oct. 1947.

TR. ROY. SOC. TROP. MED. & HYG., LONDON  
Serological tests for syphilis in treated  
*Plasmodium falciparum* malaria. M. G.  
Nelson. 41: 127-132, Sept. 1947.

WISCONSIN STATE BD. OF HEALTH QUART.  
BULL., MADISON  
Changing emphasis in venereal disease con-  
trol. E. H. Jorris. 8: 86-91, July-  
Sept. 1946.  
Public health nurses lend a hand against  
venereal disease. Marshall W. Meyer.  
8: 129-131, Jan.-Mar., 1947.

## CURRENT NOTES AND REPORTS

### A Preliminary Report on the Proceedings of the First Postwar Assembly of the International Union Against Venereal Disease, Paris, France, October 20-24, 1947

In October 1947, Dr. J. R. Heller, Jr., chief of the Venereal Disease Division of the United States Public Health Service, attended the first postwar meeting of the Union Internationale Contre le Peril Venerien, in Paris, as the delegate from the United States. Dr. Heller's preliminary report of the meeting follows.

The meeting was called by the president, Dr. W. F. Snow, and the executive committee, when it became apparent that it could not be held in Mexico City, Mexico, as originally planned.

The stated purpose of the Union is: "to set up an international barrier against the venereal diseases, to coordinate the various national programs, to study and determine the guiding principles to be applied to the campaign, so as to establish unity of principles among the member countries of the Union, and to unify methods, after full discussion between the scientific representatives of the various countries." The assembly was convened to consider the following as set forth in the president's opening message:

1. Intensification and expansion of the Union's program for disseminating knowledge of advances made by all nations in the fight against the venereal diseases since 1939, when such organized activities came to a stop because of the war.

2. Resumption, revision, and effective distribution of the Union's publications, or some satisfactory substitute, such as microfilm service, for encouraging and helping nongovernmental agencies to enter the world-wide campaign against the venereal diseases, and for the promotion of constructive social hygiene programs for the health and protection of the family and its individual members.

3. Promotion of medical, social, and education research, and of field studies and demonstrations calculated to add to our knowledge and its practical application in this area of human betterment.

There were approximately 50 delegates present, representing 17 of the 45 countries. In addition, 18 other nations sent notes indicating regret that representatives could not be sent. There was representation from the Interim Commission of the United Nations, the International League of Red Cross Societies, and the United Nations Educational, Scientific and Cultural Organization. Four delegates from Soviet Russia arrived on the fourth day of the assembly.

The first 3 days of the session were devoted to general topics previously outlined by the executive committee at its November 1946 meeting. The last 2 days



ere utilized for business sessions and  
or visits to Normandy and Western  
rance.

### **The Private Physician and Venereal Disease Control**

The private physician's role in venereal  
isease control occupied the major portion  
the opening day. There was general  
greement that no venereal disease pro-  
ram could be successful unless private  
hysicians were an integral part of the  
pproach. There was disagreement as to  
hether physicians should be reimbursed  
ally for services rendered, particularly  
morbidly and contact reporting. The  
arious delegates related experiences in  
their respective countries in regard to  
he relationship of private physicians  
with official agencies. Except in Russia,  
o marked significant difference from the  
xperience of the United States was ap-  
arent.

### **The Social Approach in Venereal Disease Control**

Delegates related the varying social  
and welfare conditions prevailing in  
Europe. Dislocation of persons, low eco-  
nomic status, personal frustration, lack  
of education, and similar factors continue  
o contribute to the spread of disease.  
Despite these factors, however, the trend  
seems to be that acute venereal infections  
are not occurring at the same rate as in  
he preceding 2 years.

The topic of the biologic, physiologic,  
and psychologic aspects of sexual be-  
havior as related to venereal disease was  
discussed briefly without any clear-cut  
opinion or point of view resulting.

### **Control of Venereal Diseases Through Treatment**

Treatment of the venereal diseases in  
Europe differs only with the ability of  
the various countries to obtain sufficient  
amounts of penicillin. The only possible  
exception is France, where the use of

metal chemotherapy is believed to be  
markedly superior to other methods of  
treatment. This may be due to relative  
inexperience with penicillin and to in-  
adequate comprehension of the public  
health approach to control of syphilis and  
gonorrhea.

Clinicians reported experiences with  
penicillin in the treatment of gonorrhea  
which generally parallel results in the  
United States. In France, however, com-  
plications of gonorrheal infection continue  
to be observed. This may be ascribed to  
their routine practice of instrumentation  
for test of cure.

Syphilis is not treated with penicillin  
except in England, Tunisia, Paris, Russia,  
and a few other centers in Europe. There  
seems to be approximately the same cure  
rate as reported in the United States.  
Crystalline G penicillin and P. O. B. are  
not on the market in Europe. Britain,  
France, Norway, Switzerland, and Italy  
seem to be the only countries manufac-  
turing penicillin, with little known of the  
situation in Soviet Russia, except that  
some factories are reported in production.

Vigorous argument and brisk discussion  
ensued in regard to treatment of the vene-  
real diseases, but the sense of the group  
was that penicillin is advocated for the  
modern treatment of both syphilis and  
gonorrhea. The United States definitely  
is regarded as the source of research and  
treatment information.

### **Report of Business Sessions**

The relationship of the Union to the  
Interim Commission and/or World  
Health Organization of the United Na-  
tions was discussed at length. Dr. Thor-  
stein Guthe, representing the Interim  
Commission of the United Nations, out-  
lined the organization of that body and  
indicated the desirability of the Union's  
assisting directly in furthering interna-  
tional venereal disease control. At the  
fourth session of the Interim Commission,  
the venereal diseases were designated as  
a first priority problem, and the appoint-  
ment of an expert committee was ap-

proved to formulate practical international control measures appropriate at this time and susceptible of early application. Dr. Guthe requested the aid of the Union in advising the expert committee in its deliberations. There was general approval of close liaison of the Union with the United Nations.

The possibility of welding the activities of the Union with the World Health Organization when it becomes a political entity was discussed in formal and informal sessions. Dr. Cavaillon, particularly, was fearful that the Union would become submerged and be eliminated entirely if associated too closely with the World Health Organization. The enthusiasm and attitudes of the remainder of the group indicated a desire to cooperate wholeheartedly in any event.

The Brussels Agreement of 1924 was discussed, particularly concerning the possibility of bringing this instrument up to date or abandoning it in favor of international regulations. It was apparent that study was needed on this subject, and therefore the appointment of a committee was indicated. It was clear, however, that maritime nations generally are desirous of strengthening and improving the tenet of the agreement, regardless of the final method of application.

The Union has been financed through the years from:

1. Grants from governments of member countries
2. Grants from voluntary agencies of member countries
3. Grants from international voluntary agencies
4. Donations from private individuals.

Financing in 1948 will be from the same sources and is partially assured by commitments from member countries to date. The cost of operation has varied from \$3,000 to \$15,000 per year.

### Recommendations

1. That a committee be appointed by the president of the Union to study program, priority, and scope, including liaison with the United Nation organizations.

2. That a committee be appointed to review the work of the former Ports Commission of the Union and to study the need for review of the Brussels Agreement of 1924 and for the inclusion of migrant groups.

3. That a committee be appointed to study biologic, physiologic, and psychologic aspects of human behavior in relation to the venereal diseases.

4. That the Executive Council be enlarged through the appointment of Dr. W. Burckhart of Switzerland, Dr. Szening Sze of China, and Dr. J. R. Heller, Jr., of the United States, as technical counselors.

5. That the same officers elected in 1946 be continued for another year.

6. That a meeting be held in 1948, probably in Denmark, upon invitation of Dr. Brun. Pedersen.

7. That special projects be continued if possible:

- a. Regional office in the United States
- b. Field parties for other areas
- c. Microfilm service and related educational activities

8. The Union went on record that it believed the administration of oral penicillin to be dangerous to public health, in the light of present knowledge.

### Conclusions

It is Dr. Heller's considered opinion that the Union is committed to full cooperation with the World Health Organization or other unit of the United Nations. The president, Dr. W. F. Snow, seems determined to make the Union a vital element in international venereal disease control, and to introduce new and more vigorous personalities and efforts toward that end. The assembly in Paris served a useful purpose in Dr. Heller's judgment in reviving the Union and placing its resources at the disposal of the United Nations.

It seems clearly apparent that Europe looks to the United States for leadership at this juncture in the field of venereal disease control, as well as in public health practices generally.

***Syphilis death rates per 100,000 population, 43 specified countries, 1940 and latest year available***

Country	1940 rate	Latest available data		Country	1940 rate	Latest available data	
		Year	Rate			Year	Rate
Argentina	-----	1936	9. 3	Iceland	0. 8	1940	0. 8
Australia (excluding aborigines)	7. 4	1943	6. 1	Ireland (Eire)	1. 9	1943	1. 9
Austria	-----	1938	4. 3	Italy	6. 1	1942	7. 0
Belgium	2. 7	1944	2. 1	Japan (proper)	10. 2	1943	9. 9
Brazil (21 cities)	49. 6	1944	47. 7	Lithuania	-----	1939	5. 6
Bulgaria	5. 4	1940	5. 4	Mexico	19. 2	1941	15. 8
Canada (excluding Yukon and Northwest Territories)	6. 6	1944	6. 8	Netherlands	4. 9	1942	6. 0
Chile	24. 5	1942	18. 6	New Zealand (excluding Maoris)	6. 6	1943	6. 4
Colombia	7. 7	1940	7. 7	Northern Ireland	4. 9	1943	5. 6
Costa Rica	14. 5	1942	22. 0	Norway	5. 7	1941	4. 7
Czechoslovakia	-----	1942	12. 2	Peru (excluding jungle population)	-----	1943	2. 9
Denmark (excluding Faroe Islands)	4. 5	1944	4. 8	Portugal (including islands)	12. 8	1944	9. 2
Egypt (Health Bureau areas)	8. 3	1943	6. 7	Rumania	-----	1939	12. 0
El Salvador	13. 3	1943	10. 8	Scotland	5. 9	1943	5. 5
England and Wales	8. 0	1941	8. 0	Spain (including islands)	6. 1	1944	5. 5
Estonia	-----	1937	10. 3	Sweden	2. 5	1942	2. 5
Finland	6. 0	1940	6. 0	Switzerland	4. 9	1943	4. 9
France	5. 3	1942	6. 0	Union of South Africa (Europeans)	-----	1939	8. 4
Germany	-----	1939	7. 5	United States	14. 4	1945	10. 7
Greece	-----	1938	2. 5	Uruguay	6. 7	1942	5. 7
Guatemala	-----	1943	. 9	Venezuela (excluding tribal Indians)	15. 0	1944	12. 9
Hungary	11. 0	1941	9. 9				

Source: "Summary of International Vital Statistics 1937-44"—Federal Security Agency, U. S. Public Health Service, National Office of Vital Statistics 1947.

## **The Hypospray Injector**

The hypospray injector is a recent development for the subcutaneous and intramuscular injection of medication in water solution, without the use of a needle. It is about the size of a two-cell flashlight. By means of a spring mechanism, the medication is ejected with sufficient force to penetrate the skin.

Advantages of the hypospray are (1) almost complete absence of pain, and (2) no sterilization of equipment before use.

It is not available for purchase at this time. Modifications will be incorporated and additional research conducted before it is placed on the market.

A study of the effectiveness of the hypospray in administering penicillin to gonorrhea patients is being made at three rapid treatment centers, namely, at Hot Springs, Ark.; Memphis, Tenn.; and Meridian, Miss. The schedule being used is a total dosage of 200,000 units of aqueous penicillin, given in 3 injections over a period of 2 hours.

Preliminary results indicate a cure rate of better than 95 percent with one course of treatment in both a control series using a syringe and in the hypospray series. A complete report of this study will be published in an early issue of the JOURNAL OF VENEREAL DISEASE INFORMATION.



## Diagnostic and Referral Activities of Health Departments, Fiscal Year 1947

Area	Diagnostic obser- vations completed <sup>a</sup>	Previously untreated infections diagnosed or admitted to clinics and percentage referred to in-patient care for therapy										Gonorrhea	
		Syphilis											
		Primary or secondary		Early latent		Congenital		Other					
Number	Percent infected	Number	Percent to rapid treatment center	Number	Percent to rapid treatment center	Number	Percent to rapid treatment center	Number	Percent to rapid treatment center	Number	Percent to rapid treatment center		
District 1—Total	173,683	38.7	9,304	52.5	7,431	25.8	823	19.2	6,464	7.4	35,641	2.9	
Connecticut <sup>b</sup>	3,865	47.8	265	49.4	161	20.5	22	22.7	398	11.8	478	4.8	
Delaware	<sup>b</sup> 1,316	43.0	211	22.7	122	23.8	11	18.2	95	2.1	<sup>b</sup> 205	1.0	
Maine	967	51.1	113	45.1	33	21.2	7	42.9	62	14.5	277	0	
Massachusetts	<sup>b</sup> 13,788	25.1	460	50.9	229	25.8	51	27.4	517	11.0	2,293	.9	
New Hampshire	172	56.4	22	45.5	6	33.3	2	50.0	9	11.1	63	1.6	
New Jersey	49,339	16.8	1,116	70.5	1,612	52.7	92	35.9	691	8.4	3,244	12.5	
New York <sup>b</sup>	70,601	46.6	4,074	58.6	2,507	10.1	231	10.0	2,832	5.9	21,631	.9	
New York City	65,307	46.9	3,443	57.0	2,267	7.4	188	6.9	2,357	5.7	20,715	6	
Pennsylvania <sup>b</sup>	32,337	58.6	2,856	39.6	2,631	24.1	396	19.2	1,745	7.7	7,285	5.4	
Philadelphia	15,474	74.7	1,573	37.5	1,568	23.7	125	6.4	1,168	5.2	5,297	0	
Pittsburgh <sup>b</sup>	4,513	62.5	171	88.9	168	50.0	24	37.5	134	16.4	335	62.4	
Rhode Island	<sup>b</sup> 1,478	44.2	187	54.5	130	36.2	11	9.1	115	0	165	2.4	
Vermont <sup>c</sup>	0		0		0		0		0		0		
District 2—Total	244,521	36.2	11,035	77.2	8,969	56.2	876	56.4	4,443	12.9	53,100	2.0	
District of Columbia	<sup>b</sup> 30,770	46.8	715	71.6	715	27.1	16	25.0	405	9.1	11,051	.5	
Maryland <sup>b</sup>	21,121	52.6	1,824	52.8	935	27.0	95	25.3	1,391	2.7	4,487	1.4	
Baltimore <sup>b</sup>	14,954	59.4	1,355	55.4	653	25.4	37	10.8	1,202	2.6	3,495	1.3	
North Carolina	<sup>b</sup> 60,432	40.9	3,986	82.7	2,753	62.0	372	61.3	877	16.4	13,376	3.0	
South Carolina	65,437	26.3	1,681	74.5	2,613	56.1	181	44.8	886	6.2	10,405	1.6	
Virginia	46,955	29.2	1,675	87.6	1,489	70.2	136	69.1	708	29.5	9,439	2.5	
West Virginia	19,806	37.2	1,130	89.8	464	82.1	76	82.9	176	51.1	4,342	2.8	
District 3—Total	208,291	37.6	8,511	72.5	6,714	36.8	604	35.4	3,924	13.1	50,637	2.3	
Illinois	69,288	45.1	1,877	91.3	1,750	35.4	111	18.0	887	3.6	24,994	2.4	
Chicago	61,456	44.4	1,272	97.1	1,424	36.7	72	12.5	743	3.9	22,834	2.5	
Indiana	12,384	45.9	1,074	72.8	868	34.0	110	39.1	484	25.2	1,759	2.7	
Kentucky	55,721	24.3	2,177	83.2	1,139	69.0	119	66.4	640	40.3	9,318	1.1	
Michigan	26,232	45.4	1,402	84.4	1,289	41.6	83	49.4	612	12.7	6,747	4.9	
Ohio	40,691	36.8	1,875	32.9	1,566	13.2	164	14.6	1,235	1.5	7,222	1.0	
Wisconsin	3,975	23.3	106	58.5	102	24.5	17	41.2	66	10.6	597	2.0	

Alabama	2,631	71.1	145	73.1	6,052	56.9	7,365	6.1
Arkansas	1,244	45.8	151	75.5	1,208	38.4	4,592	1.3
California	1,836	67.0	172	58.7	1,604	28.7	17,220	1.4
Florida	3,787	42.3	312	42.3	1,632	38.3	16,575	1.8
Georgia	3,787	42.3	312	42.3	1,632	38.3	16,575	1.8
Illinois	2,722	72.9	272	49.3	2,665	10.3	10,544	1.9
Indiana	2,344	72.9	272	49.3	2,665	10.3	10,544	1.9
Iowa	4,514	91.3	661	95.5	2,557	57.2	20,189	11.7
Kansas	2,263	86.6	189	84.7	1,007	59.1	23,757	2.2
Maryland	2,722	62.3	271	51.7	2,271	39.3	24,084	3.8
Massachusetts	2,099	38.8	25	24.0	151	25.2	0	59.3
Michigan	1,836	67.0	172	58.7	1,604	45.8	18,057	2.2
Minnesota	75	46.7	12	0	112	2.7	232	43.1
Mississippi	21	0	4	0	8	0	237	6.3
Missouri	228	58.3	14	50.0	107	14.0	1,417	1.1
Montana	353	61.5	44	59.1	289	34.9	2,933	1.4
Nebraska	4,099	2.2	1,957	.5	2,143	1.3	7,330	3.9
Nevada	4,000	1.3	1,957	.5	2,131	1.2	7,067	3.2
New Hampshire	99	40.4	0		12	16.7	263	22.4
New Jersey	1,760	45.6	150	34.0	1,472	18.8	8,881	17.3
New Mexico	101	71.3	31	50.0	29	17.2	665	3.5
New York	221	20.8	2	22.6	233	7.3	1,552	1.3
North Carolina	59	46.1	15	40.0	102	41.2	520	26.5
North Dakota	1,276	66.2	95	38.9	1,027	19.3	5,609	19.9
Ohio	1,808	51.6	39	23.1	1,474	23.8	3,581	29.3
Oklahoma	78	55.1	6	0	77	16.9	444	52.0
Oregon	0		0		2	0	4	25.0
Pennsylvania	25	72.0	1	0	2	50.0	87	5.7
Rhode Island	221	57.5	36	36.1	198	34.8	2,356	7.8
South Carolina	52	65.4	11	45.5	85	20.0	1,561	7.7
South Dakota	47	91.5	2	100.0	34	100.0	215	46.0
Tennessee	26	26.9	9	0	28	14.3	116	56.9
Texas	77	50.6	8	75.0	37	37.8	422	11.9
Utah	19	21.1	6	0	14	0	42	
Vermont	5,412	56.3	708	70.8	2,474	27.5	22,966	4.5
Virginia	185	52.4	32	59.4	124	35.5	738	8.0
Washington	568	86.1	118	78.8	416	54.3	6,847	3.5
West Virginia	4,659	52.8	558	69.7	1,934	21.2	15,381	4.8
Wisconsin	53,714	54.6	5,610	55.3	39,157	30.8	297,675	3.6
Wyoming	57,888	50.9	7,579	41.0	41,412	22.2	305,237	3.7
Total Continental United States	1,657,635							
Total United States and Territories	1,776,087							

<sup>a</sup> Excluding observations dropped or transferred without completion of diagnosis.

<sup>b</sup> Data were missing for part of the year; estimates were made for the full year based on the period reported.

<sup>c</sup> No public venereal disease clinics.

<sup>a</sup> Survey examinations resulting in "not infected" are excluded for Georgia and Mississippi (this fiscal year) and Louisiana (first half of year).

Source: Form 8954-A USPHS—Venereal Disease Division, Office of Statistics 10/31/47 (MC-MI) mjm.





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FEDERAL SECURITY AGENCY  
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**UNITED STATES PUBLIC HEALTH SERVICE**

**THOMAS PARRAN, *Surgeon General***

**Editor: J. R. HELLER, Jr., *Medical Director***  
***Chief, Venereal Disease Division***

**Approved by the Director, Bureau of the Budget, as required by  
Rule 42 of the Joint Committee on Printing**



**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.**  
**Price 10 cents. Subscription price: domestic, 75 cents a year; foreign, \$1.15**

# Hypospray Administration of Penicillin in the Treatment of Gonorrhea

bert A. Hingson, Surgeon, United States Public Health Service; <sup>1</sup> Edgar J. Easley, I. D., <sup>2</sup> A. L. Gray, M. D., <sup>3</sup> C. B. Tucker, M. D.; <sup>4</sup> Max R. Kiesselbach, Surgeon, <sup>5</sup> George E. Parkhurst, Surgeon, <sup>6</sup> Glenn S. Usher, Surgeon, <sup>7</sup> Harold H. Davidson, Senior Assistant Surgeon (R), <sup>8</sup> United States Public Health Service

uring November and December of 1943 a study was conducted on the hypodermic administration of penicillin in the treatment of gonorrhea at the rapid treatment centers at Memphis, Tenn.; Meridian, Miss.; and Hot Springs, Ark.

The purpose of the study was twofold: first, to compare the effectiveness of penicillin administered by hypospray with the effectiveness of penicillin given intramuscularly with needle and syringe; secondly, in creating a group of gonorrhea patients treated with penicillin given intramuscularly by needle, to compare these results with those obtained 18 months ago with the same schedule.

The hypospray administers solutions by injection through the skin, without the use of a needle. The hypospray instruments used in this study have a spring pressure of 125 pounds, and are designed for single injections of  $\frac{1}{4}$  cc. solution. The instrument and the prin-

ciples of its use in administering solutions have been described in an article by Hingson and Hughes (1).

The following criteria were established for this study:

1. In all selected patients, the diagnosis of gonorrhea was based on a positive culture confirmed by sugar-fermentation tests.

2. All patients were hospitalized for a period of 10 days following treatment.

3. To be considered cured, the patient had to be bacteriologically free from infection, as indicated by four negative cultures during the 10-day post-treatment observation period. Post-treatment cultures were usually performed on the second, fourth, sixth, and tenth days.

4. Every fourth male and every fourth female was given treatment by needle injection.

The schedule of therapy used in this evaluation consisted of 200,000 units of crystalline penicillin G given as follows: At zero hour, 50,000 units; at 1 hour, 50,000 units; and at 2 hours, 100,000 units.

For the intramuscular injections by needle each 50,000 units of penicillin was dissolved in  $1\frac{1}{2}$  cc. of buffered water with procaine hydrochloride.

Originally, two different concentrations were prepared for the hypospray injections—one of 50,000 units of penicillin in  $\frac{1}{4}$  cc. sterile water, and the other of 100,000 units of penicillin in  $\frac{1}{4}$  cc. sterile water. However, it was found that pronounced pain occurred in many patients at the time of injection of the concentrated solution of 100,000 units of peni-

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NOTE: Maurice C. Shepard, Senior Assistant Sanitarian (R); and Richard W. Bowman, statistician; U. S. Public Health Service, Venereal Disease Division, participated in evaluation of data.



cillin per ¼ cc.; and the pain persisted, in decreasing intensity, from several hours to several days after the injection. Furthermore, many of the patients receiving this concentrated solution also had considerable erythema or edema, or both, up to 24 hours after the injection. On the basis of this experience, the administration at the second hour was changed from 1 injection of 100,000 units to 2 injections of 50,000 units each.

The hypospray injection of penicillin was given over the biceps, triceps, or deltoid muscle. With the injection of 50,000 units, there were no reactions of clinical significance. Although many of the patients reported a stinging sensation which disappeared within a few seconds after the injection, none reported other than slight tenderness 24 hours after treatment, when questioned. A small number of patients exhibited a mild erythema 2 x 2 inches in size, 24 hours after administration. In some patients, ecchymosis was indicated by the presence of a faint black-and-blue area, which persisted for several days, around the site of the hypospray injection. It was found that less pain occurred when metycaine or procaine was added to the solution administered by hypospray than when no local anesthetic was included.

Differences were observed in the penetrability of the skin. Particularly in the administration of penicillin in some Negro males, only part of the solution penetrated by hypospray into or through the skin, and the remainder of the solution was lost over the surface of the skin. This experience confirms the findings demonstrated in cadavers by Dr. Frank Figge of the anatomy department at the University of Maryland; that is, that there are marked differences in the penetrability of the skin of different individuals (2). It is expected that a somewhat stronger spring in the hypospray instrument will facilitate the injection of such individuals.

A total of 206 patients fulfilled the requirements for inclusion in the study, of whom 158 were given penicillin by hypospray and 48 by needle administration.

Of the 206 patients, 93 percent were Negro and 7 percent were white; 76 percent were male and 24 percent were female.

Table 1 shows a cure rate of 97.9 percent among patients given the penicillin schedule by needle injection. The cure rate in this series is approximately 4 percent higher than the 94-percent cure rate obtained with the same treatment schedule, utilizing amorphous penicillin, administered to a series of 255 gonorrheal patients 18 months ago (3). The results obtained with the administration of penicillin by hypospray were almost identical with those obtained by needle administration (97.5-percent cure by hypospray as compared with 97.9-percent by needle).

**Table 1.—Results of treatment of gonorrhea with 200,000 units of aqueous penicillin administered over a period of 2 hours**

Technic of administration	Total patients followed 10 days	Cure		Failure	
		Number	Percent	Number	Percent
Needle.....	48	47	97.9	1	
Hypodermic.....	158	154	97.5	4	

Of the 5 failures observed in this study (4 to hypospray, 1 to needle administration), 4 showed a positive culture on the first posttreatment examination, and the fifth case exhibited a positive culture on the third posttreatment examination, following negative cultures on the first and second examinations. In each instance the positive culture was confirmed by fermentation test. There was 1 hypospray failure in each race-sex group. One failure occurred among the 14 persons classified as obese (7.1 percent); 3 failures among the 76 classified as medium build (4.0 percent); and none among the 68 persons classified as slender.

Such failures are usually cured by second course of penicillin. No satisfactorily proved instances are known in which gonococci cannot be eradicated from a patient, provided enough penicillin is given over a sufficiently long period of time.

his study showed that penicillin in solution can be administered effectively by the hypospray for the treatment of gonorrhea. At the present time, however, this is not yet a practical procedure under usual circumstances, because the container (metapule) to be used with the hypospray instrument must be filled with penicillin solution at a drug-dispensing station; and there is the problem of measuring and using the dissolved penicillin before appreciable deterioration—period which ranges from 3 to 7 days under refrigeration (4). It is hoped that a suspension of penicillin in oil, or a similar preparation not subject to

rapid deterioration, can be developed for use in the hypospray.

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## Evaluation of Spinal Fluid Examinations<sup>1</sup>

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There is general agreement among ophthalmologists that spinal fluid findings are of the greatest importance in the diagnosis and management of neurosyphilis. Less unanimity, however, prevails with regard to what constitutes normal standards for some tests done on the spinal fluid, and still less agreement exists about the significance of the different tests which are usually performed. Since the examination of the liquor cerebrospinalis is done with the understanding that any deviation from the normal reflects a pathologic process within the central nervous system, it is obvious that so-called "normal values" for the various tests must be firmly established.

### Cell Count

The first studies of spinal fluids in syphilis were made by French investigators, when Quincke made them possible by the introduction of the spinal puncture in 1890. At that time only two tests were performed: the cell count and the

total protein estimation. For the cell count, Nageotte's counting chamber was used and is still used in France. It has a cubic capacity of 10 mm.<sup>3</sup>, in contrast to the chamber encompassing only 0.9 mm.<sup>3</sup>, which is commonly used in the United States. With the aid of the Nageotte chamber, Sicard, Widal, and Ravaut were able to show that some patients very early in the course of their syphilitic infection exhibited a pathologic cell count. In the beginning of their work, they considered the normal spinal fluid as being completely free of cells. Later, from 10 to 15 cells in the 10-mm.<sup>3</sup> chamber were taken as the upper limit of normal.

Fuchs and Rosenthal in Vienna, who introduced the 3.2-mm.<sup>3</sup> chamber carrying their names, believed that from none to two cells per cubic millimeter was normal. Subsequent studies, especially those of Neel (1) on thousands of spinal fluids, proved beyond doubt that more than three cells per cubic millimeter constitute a deviation from the normal.

At Bellevue Hospital, with special attention given to correct cell count and with the aid of a staining fluid containing

<sup>1</sup>Study conducted at Bellevue Hospital, New York, N. Y.

methyl violet and glacial acetic acid, it has been found that up to three cells per cubic millimeter are within normal range; three to five cells represent borderline values; and more than five cells are definitely pathologic. This conclusion is based on the examination of thousands of spinal fluids collected over a period of years from patients before and after successful treatment for neurosyphilis (2). Within 3 months following adequate treatment, pleocytosis shows a marked decrease usually to normal values, and the spinal fluid rarely exhibits more than 3 cells per cubic millimeter. This fact has been determined by examining spinal fluids prior to treatment, every 3 months following treatment for the first year, and every 6 months thereafter.

Since the margin of error between normal and abnormal is so small, it is desirable to use a counting chamber of reasonably large dimensions. This is the reason why the Fuchs-Rosenthal chamber is preferred at Bellevue. Controls on many spinal fluids have demonstrated that with three countings in the 0.9-mm.<sup>3</sup> chamber or with one counting in the 3.2-mm.<sup>3</sup> chamber, an abnormal cell count will rarely be missed. To indicate that a 3.2-mm.<sup>3</sup> counting chamber has been used, cell counts are reported in thirds; the numerator indicates the number of cells in 3 mm.<sup>3</sup>

It is common knowledge that most infectious processes involving the meninges give rise to a pleocytosis. Inasmuch as the meninges may be invaded by spirochetes in the early stages of syphilis, it is not surprising that abnormally high cell counts may be found in the spinal fluid in the first few months of infection. This is, in fact, considered to be the first sign of syphilitic invasion of the central nervous system. It is also generally accepted that with the arrest of the syphilitic process the abnormal cell count returns to normal. It is the opinion at Bellevue that pleocytosis constitutes the best criterion of the activity of syphilis of the central nervous system and, therefore, that the utmost care should be exercised to obtain a correct cell count. However,

many reports on spinal fluid examinations—even from reputable laboratories—either omit cell counts entirely or show incorrect counts. This indifference can be explained perhaps by the fact that many physicians are unaware of the significance of spinal fluid cell counts in neurosyphilis. If the importance of cell counts were generally understood, greater care would be taken to assure correct counts.

### Total Protein Estimation

The second obligatory test of a spinal fluid is the total protein estimation. As mentioned before, cell counts and protein reactions were the only two tests used by the French investigators when spinal fluid punctures were first done. In spite of their limitations, valuable information was obtained from these two tests. At the beginning, the methods of protein determination were very crude; the spinal fluid was simply boiled to reveal its protein content. Later on, various methods were introduced. Among these were sedimentation procedures, which measure precipitated protein in an accurately gaged tube, and the so-called nephelometric or diaphanometric methods, which measured the turbidity of the fluid brought about by a precipitating agent. Unfortunately, most of the instruments then available for measuring sedimentation and turbidity failed to give sufficiently constant values for repeated tests.

In recent years an electrophotometer apparatus based on a selenium cell has become available. It measures turbidity with a high degree of exactness, and values obtained by it can be duplicated without difficulty. In using an electrophotometer a standard solution of protein checked by the micro-Kjeldahl gravimetric method is required. All comparisons with the standard solution can be easily read and values can be simply calculated. By this method, which uses sulfosalicylic acid as the precipitating agent, normal values for total protein in the spinal fluid range from 10 to 30 mg. percent.

Now that reproducible values for total protein are obtainable, it is possible



observe the changes of a pathologic process in the central nervous system by comparing total protein determinations over long periods. Unfortunately, as with the cell count, many laboratories fail to report total proteins in spinal fluids, or the figures given are so erratic that no intelligent appraisal of their significance can be made.

### Colloidal Test

Simultaneously with the attempts to measure quantitatively the protein content of the spinal fluid, efforts were made to differentiate between the various globulins and albumins which constitute the total protein. All types of reagents were used for this purpose. None of them, however, proved adequate until Lange introduced his colloidal gold test.

All colloidal tests are based on the ability of certain globulins, especially the gamma globulins, to precipitate the sol, whereas some of the albumins tend to protect the sol. These tests have made possible a qualitative differentiation of the proteins, which throws light on the character of the process involving the central nervous system. All substances which can be transformed into a colloidal state can be utilized for a colloidal test of the spinal fluid. Many such colloidal solutions are available. But most of them differ in their sensitivity from batch to batch, with the result that the tests of the same spinal fluid may vary when different batches of colloidal solutions are used.

Only through the ceaseless efforts of Lange has it become possible to prepare a gold sol which fulfills all the requirements of a dependable test substance (3). Using a standardized color scheme which comprises values from 0 to 20, the new Lange colloidal gold test gives constant and, therefore, reproducible color changes, which are expressed in numerical values. With the new readings, a complete discoloration of the sol is designated by the figures 18 to 20, and the unchanged gold sol by the figure 0. Because of the in-

creased sensitivity of the colloidal gold it is not unusual to find in paretics all 10 tubes of the test totally discolored, giving the sum total of 180 to 200. If there is arrest of the syphilitic process following treatment, the character of the curve may change and the sum total of the figures may show a downward trend. Thus, in addition to a qualitative test a quantitative value is obtained by adding the figures for all 10 tubes, and an accurate comparison is afforded of results obtained with spinal fluids examined at various periods in the follow-up of treated patients.

### Complement-Fixation Test

All the spinal fluid tests discussed so far fail to reveal the specific nature of the pathologic process within the central nervous system. Therefore, tests for syphilis, preferably complement-fixation tests, must be included if a correct interpretation of the spinal fluid syndrome is to be made. Here, too, in the past few years, great progress has been made in the refinement of complement-fixation tests for syphilis. First, cardiolipin has been incorporated as a new active material in the antigen. This antigen constitutes chemically known substances which have rendered the test more specific. Secondly, procedures for quantitative determination of reagin content of both blood and spinal fluid have been made available. Thus, an additional quantitative value has been gained which fits well into the ensemble of the other tests.

### Discussion

The four tests herein discussed in detail are considered obligatory tests. They form a syndrome which must be interpreted as a whole. No single item will give complete information on the process involving the central nervous system. The cell count indicates activity of the

**Table 1.—Penicillin success after malaria failure**

[Patient: E. W., age 39, white male; diagnosis, taboparesis]

Test No.	Date	Blood STS	Spinal fluid STS	Colloidal gold	Total protein	Pandy	Cells	Interim treatment
1	February 13, 1942---	4+	4+	<sup>1</sup> 5555	60	4+	225/3	February 1942: Tertian malaria (8 paroxysms) and 10 doses of mapharsen (0.06 gm)
2	September 7, 1942---	4+	4+	<sup>1</sup> 3344	35	3+	21/3	October 1942: Quartan malaria (9 paroxysms) and 10 doses of mapharsen (0.06 gm)
3	February 4, 1943---	4+	4+	<sup>1</sup> 0111	33	3+	44/3	January-June 1943: 20 doses of melarsen.
4	June 28, 1943-----	4+	4+	<sup>1</sup> 2211	35	3+	5/3	June 1943-January 1944: 20 doses of melarsen.
5	May 29, 1944-----	4+	4+	<sup>1</sup> 0111	48	Few traces	18/3	October 1944: 4,000,000 units of penicillin.
6	October 2, 1944-----	4+	4+	<sup>1</sup> 1111	71	4+	160/3	
7	October 30, 1944-----	<sup>2</sup> 12	<sup>2</sup> 37	<sup>3</sup> 84	56	3+	54/3	
8	December 4, 1944-----	12	30	82	45	2+	1/3	
9	February 5, 1945-----	9	21	70	43	Few traces	8/3	
10	May 22, 1945-----	6	20	72	44	Few traces	4/3	
11	August 6, 1945-----	3	12	43	34	Few traces	3/3	
12	January 21, 1946-----	4	13	44	31	Few traces	3/3	
13	May 13, 1946-----	2	6	48	31	Few traces	1/3	
14	October 29, 1946-----	2	12	52	28	Few traces	3/3	
15	April 18, 1947-----	3	7	41	30	Few traces	3/3	
16	November 7, 1947---	0	4	58	33	Few traces	6/3	

<sup>1</sup> Readings of first four tubes by the older Lange method of colloidal gold test.<sup>2</sup> Titered in units.<sup>3</sup> The figure given represents the sum of readings in all 10 tubes by the new Lange method.**Table 2.—Re-treatment after failure with 2,000,000 units of penicillin**

[Patient: E. H., age 26; Negro female; diagnosis, asymptomatic neurosyphilis; previously treated with 30 injections of neosarsphenamine and 34 injections of mapharsen]

Test No.	Date	Blood STS	Spinal fluid STS	Colloidal gold	Total protein	Pandy	Cells	Interim treatment
1	April 17, 1944-----	4+	4+	<sup>1</sup> 4444	25	+	100/3	May 1944: 2,000,000 units of penicillin.
2	May 16, 1944-----	4+	4+	<sup>1</sup> 3321	25	Few traces	98/3	
3	May 29, 1944-----	<sup>2</sup> 100	4+	<sup>1</sup> 1221	21	0	15/3	June 1945: Re-treated with 8,000,000 units of penicillin.
4	July 31, 1944-----	84	4+	<sup>1</sup> 1110	12	0	2/3	
5	November 21, 1944---	66	<sup>3</sup> 9	<sup>2</sup> 50	18	0	7/3	
6	May 22, 1945-----	62	27	107	27	0	70/3	
7	June 4, 1945-----	62	41	122	25	Few traces	332/3	
8	July 9, 1945-----	53	27	102	24	+	41/3	
9	September 11, 1945---	67	19	97	14	0	2/3	
10	December 17, 1945---	44	15	58	16	0	1/3	
11	March 11, 1946-----	41	12	53	13	0	3/3	
12	July 2, 1946-----	27	10	45	16	0	2/3	
13	October 28, 1946-----	33	8	55	13	0	1/3	
14	April 25, 1947-----	28	9	48	18	0	3/3	
15	October 10, 1947-----	30	7	53	19	0	5/3	

<sup>1</sup> Readings of first four tubes by the older Lange method of colloidal gold test.<sup>2</sup> The figures given represent the sum of readings in all 10 tubes by the new Lange method.<sup>3</sup> Titered in units.

process; the total protein in association with the cell count may indicate activity; the colloidal gold test in its qualitative aspect gives a clue to the prevalent type of central nervous system tissue involvement, and its quantitative values offer a revelation of the trend of the process; and finally, the complement-fixation test signifies the specific nature of the disease, and the quantitative reagin readings, together with the other tests, inform us if the syphilitic process in the central nervous system is progressing, abating, or has been definitely checked—all of which permit the intelligent management of a patient with neurosyphilis.

To illustrate the importance of the spinal fluid syndrome for the evaluation

of therapy, two case histories are presented in tables 1 and 2.

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## Louisville-Jefferson County Venereal Disease Case-Finding Demonstration

William F. Lamb, M. D.;<sup>1</sup> Max R. Kiesselbach, Surgeon, and John W. Morse, Biostatistician, U. S. Public Health Service

This paper attempts to measure the effectiveness of an intensive educational venereal disease case-finding demonstration conducted from October 16 through November 30, 1946, by the Louisville-Jefferson County Board of Health in cooperation with the Kentucky State Department of Health and the United States Public Health Service. Blood-testing a large proportion of the population has

been found to be a successful case-finding device in places where a large percentage of the people are infected with syphilis (1). However, in the Louisville-Jefferson County project, it was desirable to use a method of case finding designed for conditions of lower prevalence (2). A procedure was sought which would not involve the examination of a large number of noninfected persons, and yet would induce those persons who suspected infection to come in for examination.

Previously, favorable results had been obtained in New Orleans, where through intensive educational and informational technics the public was acquainted with the symptoms and dangers of gonorrhea (3). In an experiment conducted as part of a mass blood-testing project in Oklahoma City, it was demonstrated that

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NOTE: Administrative management of the demonstration program on which this study is based was carried out by Warren T. Davis, Jr., Public Health Representative; publicity and public education were executed by Robert P. Anderson, Informational Specialist—both from the Venereal Disease Division, U. S. Public Health Service.



educational methods emphasizing knowledge of symptoms and mode of transmission of venereal disease will influence persons who suspect infection to accept a physical examination as well as a blood test (4).

Therefore, the Louisville-Jefferson County case-finding demonstration was designed to inform the majority of the population as to the symptoms and dangers of gonorrhea and syphilis and as to the possibility of cure, and to induce persons who believed that they were infected to seek an examination from the health department or from a private physician. During this educational appeal, through public diagnostic facilities approximately 7,800 persons were examined, of whom 41.2 percent were found infected (including those previously treated).

A campaign of public information and education, including the press, radio, and outdoor advertising mediums, was used to familiarize the community with the symptoms and dangers of syphilis and gonorrhea. Opportunities for immediate diagnosis and treatment were emphasized. The project was supported by interested civic organizations; their cooperation was invaluable in the dissemination of news and information regarding the project. During the course of the project, a sound truck was employed to tour the community describing symptoms of gonorrhea and urging persons suspicious of infection to have an immediate examination at one of the several conveniently located clinics or by their private physician.

Five clinics were in operation 6 days a week in the city of Louisville; each clinic included an examining unit to draw blood, to perform physical examinations, and to take X-rays. In addition, a mobile venereal disease-tuberculosis unit offering blood tests and X-rays was in operation during the period October 24 through November 12, 1946, and traveled to several sites in Jefferson County. To expedite the handling of the increased number of blood tests to be performed, a special laboratory was set up. However, the final analysis of this selective method of

case finding revealed that the normal laboratory facilities, with additional laboratory personnel, would have been sufficient to handle the increased volume of serologic testing.

The case-finding demonstration was given further impetus by private physicians who participated in the project. Free penicillin was given them for treatment of their gonorrhea and early syphilis patients; and facilities were provided at the rapid treatment center for syphilis patients referred by private physician. Table 1 shows that 20 of the 38 syphilis cases reported by physicians were diagnosed as being primary or secondary syphilis and that 415 persons were treated for gonorrhea. Of particular interest is the fact that in the entire 12-month period before the project, only 6 cases of primary and secondary syphilis and 49 cases of gonorrhea were reported by private physicians in the Louisville-Jefferson County area.

**Table 1.—Infections reported by private physicians during the Louisville-Jefferson County project**

Total infections.....	453	
Gonorrhea.....		415
Syphilis.....		38
Primary.....		
Secondary.....		
Early latent.....		
Other.....		

Table 2 shows that 3,531 infections were identified during the Louisville-Jefferson County case-finding demonstration by public diagnostic facilities, of which 2,129 were gonorrhea infections and 1,402 were syphilis infections. Of the syphilis infections found, 1,043 were previously known to treatment (143 were given additional therapy). Among the 359 syphilis infections found which had not previously been known to treatment, 66 were identified as primary syphilis (of which 10 were seronegative) and 53 were identified as secondary syphilis. The diagnosis of gonorrhea was supported by examination of specimens stained by Gram's technic for 1,566 persons; and in 563 patients the

**Table 2.—Number of venereal disease infections reported during the Louisville-Jefferson County case-finding demonstration**

[Excluding cases reported by private physicians]

Number of persons examined	7,777				
Total syphilis and gonorrhea infections found		3,531			
Gonorrhea			2,129		
Positive laboratory findings				1,566	
Clinical and epidemiologic evidence only				563	
Syphilis			1,402		
Previously known to treatment				1,043	
Returned to treatment					143
Not returned to treatment					900
Not previously known to treatment				359	
Primary					66
Secondary					53
Early latent					116
Other					124

Slide examination using Gram's stain.

agnosis was made on clinical or epidemiologic evidence only.

During an average 45-day period within 12 months prior to the project in Louisville, table 3 shows that 74 primary and secondary syphilis and 332 gonorrhea infections were discovered. The data indicate that more than 1½ times as many cases of primary and secondary syphilis were found during the project as during an average 45 days before the project. For gonorrhea infections found, the data indicate approximately 6½ times the normal reporting.

Data available from December 1946 through August 1947, or the 9-month

try as a whole in the same periods.

Although there was a drop from the number of gonorrhea infections found during the project, almost twice as much gonorrhea was found in the average period after the project as was found before. Gonorrhea morbidity reported for the Nation did not increase nearly as much.

As previously mentioned, approximately 7,800 persons were examined through public diagnostic facilities, during the 45 days of the educational appeal. This total was more than 4 times the number examined routinely in an average period prior to the campaign. Of the

**Table 3.—Comparison of numbers of gonorrhea and previously untreated cases of primary and secondary syphilis found before, during, and after the Louisville-Jefferson County case-finding demonstration**

[All data shown are on a 45-day basis]

	Primary and secondary syphilis	Gonorrhea
Months preceding demonstration (average): October 1945 through September 1946		
During demonstration: October 16 through November 1946	74	332
Months after demonstration (average): December 1946 through August 1947	119	2,129
	62	600

period following the campaign, also indicated in table 3 that the average of primary and secondary syphilis infections reported then were slightly less than the average before the campaign. However, this slight decline parallels the trend of syphilis morbidity reporting for the coun-

ty, 7,800 persons, 41.2 percent were found infected, with or without previous treatment. Table 4 shows the percentage of infection in each race-sex group.

Several interesting observations regarding veterans and nonveterans who responded to the project were noted. Table

5 shows that a greater percentage of veterans than nonveterans was found to be infected, not only in the total group of males (40 percent vs. 32 percent) but also in each of the white and nonwhite male groups. Furthermore, relatively twice as many veterans as nonveterans mentioned the presence of symptoms upon initial interview; and approximately the same ratio is shown among those males found not to be infected. The difference in percentages of those mentioning symptoms is not so striking in the group of males found to be infected (without previous treatment). All these proportions

remain about the same even when the data on veterans and nonveterans are analyzed according to race and age (under 30 years and over 30 years). Therefore, the differences seem to be associated with veteran status rather than with race or age.

Of the persons who were asked which method they preferred for follow-up notification, 51 percent requested a letter; 2 percent asked to be notified by telephone; 16 percent stated that they would report of their own accord to learn the result of examination; 7 percent did not specify any method of notification; and less than

**Table 4.—Percentage of examined persons found infected, by race and sex**

	Number examined	Percent infected <sup>1</sup>
Total <sup>2</sup> .....	7,777	41
White:		
Male.....	2,084	27
Female.....	1,239	30
Nonwhite:		
Male.....	2,415	43
Female.....	2,038	58

<sup>1</sup> Includes those previously treated.  
<sup>2</sup> Includes race and sex not stated.

**Table 5.—Percentage of examined veterans and nonveterans found infected, and percentage mentioning symptoms**

[Males examined <sup>1</sup> in Louisville-Jefferson County case-finding demonstration]

	Total		Males			
			White		Nonwhite	
	Veteran	Non-veteran	Veteran	Non-veteran	Veteran	Non-veteran
	Percent	Percent	Percent	Percent	Percent	Percent
Infections among total males examined <sup>2</sup> .....	40	32	33	22	49	
Patients mentioning symptoms:						
Of total examined.....	44	22	43	20	45	
Of patients infected but previously untreated.....	89	73	93	75	86	
Of noninfected.....	20	11	21	11	18	

<sup>1</sup> Results of examination of males reporting for diagnosis through contact investigation or other required tests excluded.  
<sup>2</sup> With and without previous treatment.

NOTE.—All differences between the percentages shown for veteran and nonveteran groups are significant the 1-percent level.



percent asked that their private physician be notified.

Table 6 shows by race and sex the results of examination of persons reporting diagnosis, and it also indicates the percentage of persons who did and persons who did not mention symptoms when first requested examination. Persons reporting for examination as a result of contact investigation and of premarital and prenatal testing are excluded.

This tabulation shows that relatively more of the nonwhite females mentioned symptoms before examination (46 percent) than did the other race-sex groups. Also, relatively more of the nonwhite females found not infected mentioned symptoms (27 percent) than did the other groups.

However, relatively fewer of the nonwhite females actually infected with gonorrhea or early syphilis mentioned symptoms than did the other race-sex groups.

Table 6.—Percentage of persons mentioning symptoms, by race, color, and results of examination<sup>1</sup>

	Total				White								Nonwhite							
					Male				Female				Male				Female			
	Symptoms		No symptoms		Symptoms		No symptoms		Symptoms		No symptoms		Symptoms		No symptoms		Symptoms		No symptoms	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Number examined.....	2,502	35	4,671	65	620	31	1,408	69	347	30	813	70	694	32	1,465	68	841	46	985	54
Not infected.....	731	17	3,542	83	226	15	1,245	85	131	16	699	84	165	14	1,033	86	209	27	565	73
Infected <sup>2</sup> .....	1,771	61	1,129	39	394	71	163	29	216	65	114	35	529	55	432	45	632	60	420	40
Gonorrhea.....	1,469	79	379	21	339	90	39	10	187	81	44	19	439	85	77	15	504	70	219	30
Syphilis not previously treated:																				
Primary.....	51	88	7	12	20	95	1	5	6	86	1	14	22	85	4	15	3	75	1	25
Secondary.....	38	88	5	12	7	100	0	0	5	83	1	17	10	100	0	0	16	80	4	20
Early latent.....	38	43	51	57	1	33	2	67	4	50	4	50	5	26	14	74	28	47	31	53
Other.....	27	24	84	76	1	6	15	94	0	0	7	100	7	15	41	85	19	47	21	53

<sup>1</sup>Results of examination of persons reporting for diagnosis through contact investigation or other required tests excluded.

<sup>2</sup>With and without previous treatment.

Pertinent data from table 6 are summarized in the accompanying tabulation.

	Percentages mentioning symptoms prior to examination	
	White	Non-white
Total examined:		
Male.....	31	32
Female.....	30	46
Not infected:		
Male.....	15	14
Female.....	16	27
Infected with gonorrhea:		
Male.....	90	85
Female.....	81	70
Infected with primary or secondary syphilis:		
Male.....	96	90
Female.....	85	79

This may mean that the nonwhite female is less able to identify the symptoms of venereal diseases or to associate them with her condition.

It is interesting to note that among those infected with gonorrhea or early syphilis, relatively more males than females and more white than nonwhite persons mentioned symptoms before examination.

## Summary

The Louisville-Jefferson County Board of Health, in cooperation with the Kentucky State Department of Health and the

United States Public Health Service, conducted an intensive educational venereal disease case-finding demonstration during the period October 16 through November 30, 1946.

The project was designed to induce persons who believed they were infected to seek an examination from the health department or from a private physician. Approximately 7,800 persons were examined, of whom 41.2 percent were found infected, including those previously treated. The total examined was more than 4 times the number routinely examined in an average period prior to the campaign.

Only 6 primary and secondary syphilis and 49 gonorrhea cases were reported by private physicians during the 12 months before the project, but 20 primary and secondary syphilis and 415 gonorrhea cases were reported by private physicians during the project (45 days).

More than 1½ times as many primary and secondary syphilis cases and 6½ times as many gonorrhea cases were found by public diagnostic facilities during the project as were found normally before the project.

In the period December 1946 through August 1947 (the 9-month period after the campaign), primary and second syphilis infections reported in an average 45-day period were slightly less than the average before the project.

Almost twice as much gonorrhea was found in the average period after the project as was found before.

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# The VDRL Slide Flocculation Test for Syphilis

## II. A Supplementary Report <sup>1</sup>

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A preliminary report (1) described the Venereal Disease Research Laboratory slide test technic,<sup>2</sup> which was constructed on the basis of preselected restrictive

requirements. These prerequisites were established to obtain a satisfactory flocculation test procedure which could be (a) standardized, (b) reproducible, and (c) rapidly performed; that is, a simplified technic, characterized by acceptable sensitivity and specificity. Included in the report was a tabulation of results obtained with the VDRL slide test and with several accepted flocculation methods.

<sup>1</sup> From the Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island 4, N. Y.

<sup>2</sup> A detailed copy of the technic for this test may be obtained by request from the Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island 4, N. Y.

complement-fixation tests on more than 600 specimens. The relatively high proportion of strongly positive as compared to weakly positive reactions produced by this test on specimens from syphilitic donors was encouraging. More than 600 negative results were simultaneously obtained with the VDRL slide, Kahn standard, and Mazzini tests on serums from presumably nonsyphilitic individuals.

Since publication of the preliminary report, comparative tests have been performed on 6,605 additional serums from syphilitic donors taken before, during, and after treatment. These findings are assembled in table 1. An analysis of these figures shows the sensitivity of the VDRL slide test to be within the limits set by the tests of standard reactivity.

The percentages of positive reactions recorded in this series vary within narrow limits, and the proportion of such reactions produced by the VDRL slide test is found to be between the extremes set by the other test performances. From consideration of only the positive findings, it is evident that the potential of the VDRL slide test as an indicator of syphilis reagin is approximately equivalent to that of tests previously established at an acceptable level of sensitivity.

Complete appraisal of test sensitivity must, however, also include an analysis of the weaker reactions (doubtful and weakly positive). The relative sensitivity among the several testing methods then becomes more divergent, and closer scrutiny of test efficiency is possible. The

percentage of weakly positive reactions recorded in table 1 under the VDRL slide test is appreciably less than the percentage of doubtful results produced by the other two slide tests listed (Kline diagnostic and Mazzini flocculation).

The ability of a test to elicit definite responses such as positive or negative, with a minimum of doubtful reactions, is a desirable characteristic. This is particularly true in microfloculation procedures, which in the past have allowed for a relatively broad doubtful zone.

It is significant to note at this point that fewer zonal reactions were obtained with the VDRL slide test than with the other tests performed on the specimens in the previous study (1). This factor is important insofar as the appraisal of a test is concerned, since zoning produced by a strongly positive serum may be misinterpreted as a weak or negative reaction.

An additional series of specimens from 400 presumably nonsyphilitic hospitalized individuals was subjected to the VDRL slide, Kahn standard, and Mazzini flocculation tests. Negative reactions were obtained in each instance by these 3 procedures.

In summary, these findings indicate that the VDRL slide test apparently functions at a satisfactory level of sensitivity, produces a relatively low proportion of weakly positive reactions, and yields satisfactory specificity on specimens selected at random from a hospital population. Additional evidence concerning sensitivity

**Table 1.—Reactions observed on 6,605 specimens of blood obtained from syphilitic donors before, during, and after treatment**

Tests	Positive		Doubtful		Negative		Specimens not tested
	Number	Percent	Number	Percent	Number	Percent	
Kahn standard.....	3,200	48.6	384	5.8	3,008	45.6	13
Colmer.....	3,152	48.2	246	3.8	3,137	48.0	70
Kline diagnostic.....	2,790	42.7	900	13.7	2,851	43.6	64
Angle flocculation.....	3,088	48.5	278	4.4	2,998	47.1	241
Clinton.....	3,046	48.7	377	6.0	2,843	45.3	339
Mazzini flocculation.....	3,124	47.6	890	13.5	2,550	38.9	41
VDRL slide.....	3,115	47.7	482	7.3	2,942	45.0	66

<sup>1</sup> Weakly positive reactions are placed in the doubtful column for purposes of comparison only.



and specificity levels of the VDRL slide test is contained in reports submitted on unofficial performances of this test by the Venereal Disease Research Laboratory and five State laboratories on several hundred blood specimens tested during the 1947 National Serologic Evaluation Survey. These data are presented in table 2.

antigen reactivities, and is therefore employed to guide antigen adjustment to a standard level.

Purified lecithins from beef heart, obtained from the New York State Laboratory, a commercial laboratory, and the Venereal Disease Research Laboratory have had varying capacities as cardiolipin

Table 2.—Results of the VDRL slide test as performed by several laboratories during the 1947 National Serologic Evaluation Survey

Laboratory	Syphilitic donors				Sensi- tivity	Nonsyphilitic donors				Speci- ficity
	Positive <sup>1</sup>		Negative			Positive		Negative		
	Nun- ber	Per- cent	Nun- ber	Per- cent	Per- cent	Nun- ber	Per- cent	Nun- ber	Per- cent	Per- cent
Venereal Disease Research Lab- oratory	178	85	32	15	85	0	0	135	100	10
A-----	176	83	36	17	83	0	0	132	100	10
B-----	191	89	23	11	89	0	0	135	100	10
C-----	180	89	23	11	89	0	0	129	100	10
D-----	180	85	31	15	85	0	0	134	100	10
E-----	177	87	32	13	87	0	0	133	100	10

<sup>1</sup> This category includes all positive and weakly positive results.

Discussion

During the initial study of antigen formulae for the VDRL slide flocculation test, variations in reactivity levels were encountered in antigens prepared from successive lots of reagents. In all instances, in this laboratory, these changes in serologic behavior were attributable to the lecithins used.

Antigen for the VDRL slide flocculation test (1) is assembled from cardiolipin, purified lecithin, and cholesterol and alcohol of designated purities (2). The antigen is standardized by adjustment of the lecithin content. This adjustment procedure has been found to be a necessary adjunct to the preparation of a standard antigen, even when components of acceptable chemical assay, as defined by Pangborn (3), were used, in order to reproduce antigens of identical serologic reactivity. The microfloculation slide test technique has proved to be the most sensitive procedure for comparison of

pin antigen sensitizers when employed in identical amounts calculated from gravimetric equivalents based on phosphorus determinations. This difference in antigenic capacity has necessitated the use of lecithin concentrations between the extremes of 0.20 percent and 0.27 percent when different lots of lecithin have been employed, for the assembly of standard antigen for the VDRL slide flocculation test. For this reason an absolute value for lecithin content of antigen for this test cannot be predicted but must be determined by serologic assay.

Summary

1. A supplementary report of results obtained with the VDRL slide flocculation test and other testing procedures on serums from syphilitic and nonsyphilitic donors is presented.
2. Standardization of antigen for this flocculation procedure is discussed.

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## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of all articles concerned with venereal diseases or related subjects which have been published in the better known journals both here and abroad during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

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- Lymphogranuloma venereum. A histologic study of the primary lesion, bubonulus, and lymph nodes in cases proved by isolation of the virus. Walter H. Sheldon and Albert Heyman. Am. J. Path., 23: 653-672, 1947.
- The authors present a study of the lesions of lymphogranuloma venereum showing that the histologic picture of the disease is sufficiently distinct to permit diagnosis. The histologic pattern in this investigation was seen to be identical in the primary lesions, the bubonulus, and in the lymph nodes.

Twelve specimens were studied, eight of which were taken from patients in whom the diagnosis of lymphogranuloma venereum was proved by isolation of the virus; the remaining four specimens were obtained from individuals who were considered to have the disease on the basis of clinical and laboratory findings. The specimens consisted of seven primary lesions, one bubonulus, and four inguinal lymph nodes.

The primary lesion was typically seen to be a shallow ulcer in the penile skin or mucosa, with a fundus consisting of necrotic tissue covered by an exudate of fibrin, cellular debris, and some neutrophilic polymorphonuclear leucocytes. The ulcer, surrounded by an ill-defined area of dense inflammatory cellular infiltration predominated by large mononuclear cells, contained a cavity which was the necrotic core of the granuloma, the contents of which were for the most part evacuated.

The bubonulus was seen to consist in numerous foci of inflammatory cells throughout the skin of the prepuce. Large granulomatous areas were formed by coalescence of smaller lesions, some containing small blood vessels with compressed lumina. The center of the granuloma had undergone necrosis after the blood vessels were obliterated, while the lymphatics were dilated and contained granular eosinophilic material with a few lymphocytes and large mononuclear cells. As to lesions of the inguinal lymph nodes, stellate abscesses were numerous throughout the cortex but less frequent in the medulla. Compression and obliteration of capillaries led to ischemic necrosis in the center of the cell masses and eventually resulted in the formation of abscesses which were identical to those seen in the bubonulus.

The histologic picture of lymphogranuloma venereum, according to the authors, may thus permit not only a reasonably accurate diagnosis but also differentiation of this disease from other venereal disease infections. Biopsy is therefore recommended as a diagnostic aid in selected cases of this infection.

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**A joint report on a cooperative investigation of the efficacy of species of penicillin in the treatment of experimental syphilis.** R. C. Arnold, Ruth A. Boak, Charles M. Carpenter, Alan M. Chesney, William L. Fleming, Boris Gueft, John F. Mahoney and Paul D. Rosahn. Am. J. Syph., Gonorr. & Ven. Dis., 31: 469-475, 1947.

The authors report on a study of the comparative therapeutic efficacy of penicillins F, G, K, and X in experimental rabbit syphilis.

Sixty rabbits, of varying breeds and weighing between 2.5 and 3.5 kilograms, were inoculated intratesticularly, intralaterally, or subscrotally with the Nichols strain of *Treponema pallidum*. These animals, divided into groups of 10, were treated with a given specimen of penicillin, and although each animal in a given group received the same dosage of penicillin per kilogram of body weight, the total dosage of the groups varied in accordance with the following schedule, expressed in terms of Oxford units per kilogram of body weight: 500, 1,000, 2,000, 4,000, 8,000, and 16,000. Treatment was begun 6 weeks after inoculation in animals showing lesions, each rabbit receiving an intramuscular injection of penicillin every 4 hours to a total of 24 injections. The treated animals were observed for 120 days after treatment, at which time lymph node transfers were made by intratesticular injection from rabbits showing no signs of syphilis to normal rabbits which were kept 4 months before being accepted as negative. No lesions developing in any of the rabbits were regarded as syphilitic unless dark-field examination of the lesions revealed *T. pallidum*.

The results, which are given in detail in tabular form, showed penicillin G to be the most potent of the penicillins used, penicillin F requiring about 6 times as large a dose as penicillin G to achieve the same effect. The CD<sub>50</sub> dose for penicillin F was found to be between 5,200 and 20,800 units per kilogram, whereas the CD<sub>50</sub> dose for penicillin G was seen to be between 1,000 and 2,000 units per kilogram. The highest dosage of penicillin K tested, 16,000 units per kilogram, failed to cure half the animals treated, and the data on penicillin X were so inexplicably discrepant as to be insufficient for comparing this species of penicillin with the others used in this study.

**Comparative effectiveness of penicillins G, F, K, and X in experimental syphilis as determined by a short in vivo method.** Thomas B. Turner, Mary C. Cumberland and Huan-Ying Li. Am. J. Syph., Gonorr. & Ven. Dis., 31: 476-484, 1947.

This article presents a short method for testing the relative therapeutic activity of penicillins G, F, K, and X in experimental rabbit syphilis.

Rabbits of various breeds were inoculated intracutaneously at 8 or 10 sites on the clipped back with 0.1 cc. of a testicular emulsion of *Treponema pallidum* of the Nichols strain. Within 14 to 21 days after inoculation the syphilomas which developed were considered to be suitable for use in penicillin assay. For a given day's test, 6 to 12 rabbits were selected and pretreatment spirochete counts were made on each of two typical syphilomas of each rabbit in a manner described in detail. These counts were made on a basis of 100 oil-immersion fields per lesion, or a total of 200 fields. On the day of completion of the pretreatment counts, treatment with one of the penicillins was begun, the dosage for each rabbit being computed on the basis of milligrams per kilogram of body weight, with the total amount of drug being given by intramuscular injection in three equal doses at 2-hour intervals. Posttreatment counts were made approximately 24 hours after the initial injection of penicillin by the

same technic used in the pretreatment counts.

The results of the study showed that the reduction in spirochete count is directly related to the dose of penicillin administered and that considerably smaller doses of penicillin G are required to effect a proportionate reduction in the spirochete count than are required by penicillins F, K, or X. The effective dose (ED), or that amount of penicillin which causes a reduction in the spirochete count to 10 or fewer motile *T. pallidum* per 200 fields in 24 hours, is discussed in relation to the various species of penicillin used. Computing the ED<sub>50</sub> for the 4 penicillins on the basis of Oxford units, the comparative figures are as follows: G=183 O.u./kg.; F=1,024 O.u./kg.; K=>4,380 O.u./kg.; and X=1,054 O.u./kg.

It was seen in this study that disappearance of *T. pallidum* from syphilomas was rapid following the administration of amounts of penicillin at or above the ED<sub>50</sub> level. The number of spirochetes decreased significantly in 4 to 6 hours and 99 percent of the organisms were commonly seen to disappear completely within 24 hours of the initial injection of penicillin.

**Comparative effectiveness of penicillins G, F, K, and X in experimental relapsing fever.** Mary C. Cumberland and Thomas B. Turner. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31: 485-488, 1947.

The studies reported in this paper were undertaken to determine the relative therapeutic activity of penicillins G, F, K, and X in experimental relapsing fever infections and to determine whether there was any correlation between these results and those obtained in experimental rabbit syphilis.

Rats were inoculated intraperitoneally with *Borrelia novyi* and the plasma obtained at the height of their infection was stored at approximately -72° C. Swiss mice weighing from 14 to 16 gm. were inoculated intraperitoneally with a constant dose of this infectious material and 24 hours later were divided into groups of 3 mice which were injected intraperitoneally with graded doses of

penicillin. An untreated control group was provided in each test.

Twenty-four hours after treatment spirochete counts were made on the blood of each animal on the basis of the number of spirochetes seen in a 3-minute search using a darkfield microscope. The control or untreated mice showed an average of 26 relapsing fever spirochetes per 3-minute count, and while all the penicillin fractions used were able to reduce the counts when given in sufficient dosage, their comparative activity varied. About 10 mg. per kilogram of penicillin G, 30 mg./kg. of F, and 60 mg./kg. of K or X were required to obtain a count of less than 2 spirochetes, for example.

Since the experimental method did not cure the mice, it was necessary to select an end point other than cure for evaluating the effectiveness of the fractions used. The effective dose (ED), or the amount of penicillin necessary to lower the count to 2 or less spirochetes, was chosen since this number of spirochetes represented at least a 90 percent reduction from the average control count of 26. By this method, the ED<sub>50</sub> of crystalline penicillins G, F, K, and X were found to be 8.3, 15, 37, and 24 mg. per kilogram, respectively, penicillin G being significantly more active against experimental relapsing fever than penicillins F, K or X.

While the results of this experiment correlate in a general way with those obtained in experimental syphilitic infection, the authors do not regard this test as a reliable means of assaying the comparative activity of penicillin fractions against *Treponema pallidum*.

**Reinfection in experimental syphilis in rabbits following penicillin therapy. II. Reinfection in early latent syphilis.** R. C. Arnold, J. F. Mahoney and J. C. Cutler. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31: 489-492, 1947.

The authors refer to the previously reported part I of this paper, relating to an investigation of reinfection in early infectious syphilis, in connection with the present study of reinfection in early latent syphilis.



In the present experiment, 34 normal male rabbits were infected with the Nichols strain of *Spirochaeta pallida*; all animals developed scrotal chancres and the diagnosis of syphilis was confirmed by darkfield examination. The clinical lesions were allowed to heal spontaneously and the animals were observed for 6 months without treatment before antisyphilitic therapy was instituted in the form of 300 units of sodium penicillin per kilogram administered intramuscularly every 2 hours to a total of 48 injections. Ten days after the termination of penicillin therapy, the rabbits were reinoculated with the Nichols strain of *S. pallida*.

Weekly clinical examinations revealed no chancre development at the site of reinoculation, and after 4 months, the inguinal and popliteal nodes were removed or transfer to normal animals which were observed for 100 days. During this time, 53 percent of these animals developed syphilis, indicating a symptomless invasion in the originally reinoculated animal. The remaining transfer animals failed to develop clinical evidence of syphilis, and node transfers to second passage animals produced no demonstrable evidence of the disease.

In the previously reported study, it is noted that 73 percent of the rabbits presented a symptomless reinfection; in this study, only 53 percent experienced this type of reinfection, 47 percent of this early latent group displaying complete protection. It is therefore concluded that the immune factors occurring in early latent syphilis are more forceful than those observed in early infectious syphilis, the potency of the protective reaction varying with the duration of the disease and with the immune response of each animal.

**The use of the Mandler diatomaceous filter in the study of the infectious agent in syphilitic mice.** Sture A. M. Johnson and Udo J. Wile. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31: 493-497, 1947.

In connection with the fact that *Treponema pallidum* has not been found readily, if at all, in the brains of inoculated mice capable of causing syphilitic

changes in rabbits, the authors report on five experiments to determine whether the infectious agent might be filtrable.

In one of these experiments, the dark-field positive testicles of a rabbit infected intratesticularly with the Nichols strain of *T. pallidum* were ground and emulsified, and 12 white male mice were inoculated in the region of the cisterna magna with 0.05 cc. and intraperitoneally with 0.5 cc. of this emulsion. Seven of the mice were sacrificed 53 days later and the brains were emulsified and centrifuged at a low speed for 10 minutes. Ten cubic centimeters of the supernatant fluid were passed at a pressure equal to 50.0 cm. of mercury through a Mandler filter; 2 rabbits were inoculated with 3.0 cc. of this filtrate and two other rabbits were inoculated with 2.0 cc. of the unfiltered supernatant material. The rabbits inoculated with the filtrate failed to develop syphilis in 122 days, whereas the rabbits inoculated with the unfiltered fluid developed darkfield positive lesions in 44 days. Subsequent inoculations with unfiltered syphilitic rabbit material into the 2 animals who had failed to develop the disease produced positive lesions in 33 days. Darkfield examination of the mouse material proved negative, however.

A summary of the five experiments reveals that mouse material which is capable of causing syphilitic changes in a rabbit loses this capacity upon filtration through a coarse Mandler diatomaceous filter. Filtrates of darkfield positive rabbit testicular material, on the other hand, were capable of causing syphilitic changes in rabbits, although this effect was lost when rabbit material was mixed with mouse brain.

The authors postulate that an infravisible stage of *T. pallidum* in the mouse fails to pass through a coarse filter under the conditions of these experiments possibly because of its being bound so closely to the colloids of the brain as to prohibit passage.

**The massive intravenous penicillin therapy of early syphilis.** Erwin E. Peters and Robert L. Barton. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31: 522-532, 1947.



This article concerns a group of 275 patients exhibiting clinical evidence of primary or secondary syphilis treated by massive intravenous penicillin therapy.

The patients, all of whom had lesions which were darkfield positive for *Treponema pallidum*, were selected on the basis of freedom from detectable pathologic changes of the cardiovascular, pulmonary, renal, and hematopoietic systems. Sodium penicillin was administered by the continuous intravenous drip method in amounts ranging from 10 to 25 million units over a period of 24 hours. The longest period of observation, at the time of writing, was 19 months since these patients were treated from March 28, 1945, to May 8, 1946. Ages of these patients ranged from 15 to 48 years, and the diagnoses were as follows: 50, seronegative; 65, seropositive primary; 143, secondary; and 17, recurrent infectious syphilis.

The data show that the form of treatment used in this study was unsuitable for early syphilis, however, the cumulative percentages of failures at the end of a 12-month period of observation being 67.8, 66.2, 20.5, and 35.2 for patients receiving 10, 15, 20, and 25 million units of penicillin, respectively. Relapses tended to occur early, 78 percent of the observed failures occurring within a period of 5 months after treatment. Sixty-four percent of the failures were diagnosed on clinical grounds and 36 percent on serologic grounds.

Reactions to therapy, although frequent, were generally mild. The almost universal occurrence of moderate to severe discomfort at the sites of injection of the "Pitkin menstruum" containing heparin necessitated the routine use of pantopon. Temperature elevation of some degree occurred in all but 1 patient, and 28 individuals developed moderately intense gastrointestinal disturbances. Renal complications usually consisted of transient albuminuria, hematuria, or cylinduria associated with diminished renal function and temporary azotemia; all patients showing these reactions recovered rapidly, however.

It is therefore concluded that while 10 million to 25 million units of penicillin administered intravenously in 24 hours were well tolerated, these dosages are grossly inadequate for the treatment of early syphilis.

**The intensive treatment of early syphilis in nine to fifteen weeks with triweekly injections of mapharsen (oxophenarsine hydrochloride) and concomitant weekly injections of bismuth: an analysis of the results in 110 cases.** David D. Dexter. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31: 533-541, 1947.

In a discussion of the status of all patients treated for early syphilis at the Medical Clinic of the Johns Hopkins Hospital from October 1941 to September 1945, the author has selected 110 of these patients for detailed study.

Selection was made on the following basis: (1) A diagnosis of primary or secondary syphilis; (2) absence of previous antisyphilitic therapy; and (3) administration at the Hospital of approximately 30 injections of triweekly mapharsen and concomitant weekly bismuth (10 doses) within a total time period of 9 to 15 weeks. The ratio of Negro to white patients was approximately 7:1 and of females to males, 3:2.

The results of therapy showed that 69.7 percent of the patients became and/or remained seronegative, while 26.4 percent of the patients had falling quantitative serologic tests for syphilis at final observation, so that 95.5 percent therefore responded well to the treatment given. The cumulative percentage becoming seronegative was 88.9 by the end of the third year, it is stated.

Five patients, all with secondary syphilis, were classified as treatment failures; these included 1 case of seroresistance, 1 case of serorelapse, and 3 cases of infectious relapse. Reinfection was considered more probable than relapse in the four latter cases due to the time relationships. Spinal fluid examination in 73 of the 110 patients at a median time period of 6 months following the start of therapy revealed no abnormalities. Minor sub-

active reactions, such as nausea, vomiting, and malaise, were not of sufficient frequency or severity as to require analysis. Serious toxic reactions occurred in patients, consisting of 4 cases of allergic dermatitis, 3 cases of agranulocytosis, and 2 cases of jaundice. All these patients recovered, and no examples of toxic encephalopathy were observed.

The author concludes that this semi-intensive method of arsenic-bismuth therapy provides exceedingly satisfactory results in early syphilis. As pointed out, however, the main obstacle to prolonged treatment is difficulty in case holding, from 25 to 60 percent of patients failing to complete the course despite intensive case-holding efforts.

J. J. TROP. MED., BALTIMORE

Relapsing fever on the Isthmus of Panama. Report of 106 cases. Carlos Calero. 26: 761-769, Nov. 1946.

Tropical medicine and the challenge of global war. James Stevens Simmons. 27: 1-9, Jan. 1947.

Tropical phagedenic ulcer (Vincent's ulcer). Harvey Blank. 27: 383-398, May 1947.

ANN. DE DERMAT. ET SYPH., PARIS.

Bismuth treatment of early syphilis. Société Française de Dermatologie et de Syphiligraphie. 6: 279, 1946. [Abstracted in Brit. J. Ven. Dis., London, 23: 93, June 1947.]

CH. DERMAT. & SYPH., CHICAGO

\*Penicillin in the treatment of experimental syphilis of rabbits. I. The therapeutic activity of penicillin in single and multiple doses in isotonic solution of sodium chloride and peanut oil-beeswax by intramuscular injection. John A. Kolmer. 55: 741-748, June 1947.

\*Granuloma inguinale treated with streptomycin. Report of three cases. Robert L. Barton, Robert M. Craig, George X. Schwemlein and Theodore J. Bauer. 56: 1-6, July 1947.

\*Effects of resin of podophyllum on normal skin, condylomata acuminata and verrucae vulgares. Maurice Sullivan and Lester S. King. 56: 30-47, July 1947.

Cutaneous diphtheria. Two unusual cases of eruptions resembling lymphogranuloma venereum and ectodermosis erosiva pluriorificialis. Frederick Reiss. 56: 216-221, Aug. 1947.

Extragenital chancre of the ear. Anthony S. Ripa and Alexander G. Bartlett. 56: 264-266, Aug. 1947.

Cutaneous reactions to penicillin. H. J. Templeton, C. J. Lunsford and H. V. Allington. 56: 325-338, Sept. 1947.

Cutaneous eruptions from streptomycin. Karl Steiner and George W. Fishburn. 56: 511-516, Oct. 1947.

**Penicillin in the treatment of experimental syphilis of rabbits. I. The therapeutic activity of penicillin in single and multiple doses in isotonic solution of sodium chloride and peanut oil-beeswax by intramuscular injection.** John A. Kolmer. Arch. Dermat. & Syph., 55: 741-748, 1947.

In the experiments reported, all rabbits were inoculated intratesticularly with the Nichols-Hough strain of *Treponema pallidum*, and treatment was instituted 5 to 6 weeks later when acute orchitis, with strongly positive results on darkfield examination, had developed in all the animals. At the end of 70 days, the popliteal lymph nodes of all treated rabbits were inoculated into the testicles of new animals which were observed for a minimum period of 4 months.

The four following types of penicillin therapy were used: (1) Single doses in isotonic solution of sodium chloride; (2) single doses in peanut oil and beeswax; (3) multiple doses in isotonic solution of sodium chloride; and (4) multiple doses in peanut oil and beeswax. Detailed results are presented in tabular form.

Rabbits were given single intramuscular injections of commercial and purified penicillins in doses of 10,000, 30,000, and 100,000 units per kilogram. Since positive results from transfers of lymph nodes were secured in every instance, the single minimal curative dose in isotonic solution of sodium chloride was therefore more than 100,000 units per kilogram of weight. Greatly different results, however, were obtained when similar doses were administered in peanut oil and 3 percent beeswax, when all rabbits treated with single doses of 30,000 and 100,000 units showed biologic cure. The single minimal curative dose of penicillin in this medium was thus approximately 10,000 units per kilogram of weight.

In the multiple-dose experiments, penicillin in isotonic solution of sodium chloride was administered intramuscularly once daily for 8 days in succession in doses totaling 8,000, 40,000, and 200,000 units, respectively. It was found that the minimal curative dose of penicillin in this medium was in the vicinity of 5,000 units per dose, totaling 40,000 units per kilogram of weight. When the same doses were given twice daily for 8 days in succession, however, the minimal curative dose was found to be about 1,000 units per kilogram, totaling 16,000 units. With the administration of multiple doses in peanut oil and beeswax once a day for 8 days in succession, the minimal curative dose was seen to be approximately 1,000 units per kilogram or a total of 8,000 units, whereas the same doses given intramuscularly twice daily for 8 days showed the minimal curative dose to be less than 1,000 units, totaling less than 16,000 units per kilogram of weight.

It is therefore concluded by the author that penicillin suspended in peanut oil and beeswax, administered by intramuscular injection, is therapeutically more effective in the treatment of acute syphilitic orchitis of rabbits than that dissolved in isotonic solution of sodium chloride.

**Granuloma inguinale treated with streptomycin. Report of three cases.** Robert L. Barton, Robert M. Craig, George X. Schwemlein and Theodore J. Bauer. *Arch. Dermat. & Syph.*, 56: 1-6, 1947.

The authors discuss the remedies, particularly antimony compounds, hitherto used in the treatment of granuloma inguinale, and refer to the recent work (1945) of Anderson et al., pointing to the nature of the Donovan body as a bacillus.

Experience with more than 100 patients, treated by antimony and potassium tartrate, stibophen or antimony and lithium thiomalate after diagnosis of granuloma inguinale made from clinical grounds and from demonstration of Donovan bodies in stained specimens of fresh spreads, closely paralleled that of Robinson and his colleagues.

From this experience, it was felt that a study of the effect of an antibiotic on the disease was warranted. Inasmuch as adverse reports on treatment with penicillin had been published, it was decided to limit the study to the effect of streptomycin on granuloma inguinale. Therefore, streptomycin was administered to three selected patients with clinical evidence of the disease but with no previous treatment.

Since the hospital supply of streptomycin was limited, the daily doses were small. The drug was administered by intramuscular injections of 20,000 and 30,000 units every 3 hours in total doses of 4,110,000, 6,460,000, and 7,050,000 units.

The authors state that all three patients, after treatment, showed excellent clinical improvement with disappearance of Donovan bodies from the lesions; two patients exhibited relapse after the supply of streptomycin was exhausted, and one patient who received streptomycin for 4 days showed no evidence of relapse after observation for 2½ months.

**Effects of resin of podophyllum on normal skin, condylomata acuminata and verrucae vulgares.** Maurice Sullivan and Lester S. King. *Arch. Dermat. & Syph.*, 56: 30-47, 1947.

The authors herein discuss the biological action of resin of podophyllum on condylomata acuminata, verrucae vulgares, and normal skin.

Clinical observations on the treatment of 50 patients with condylomata acuminata by a 25-percent suspension of podophyllum in liquid petrolatum are described. In the 48 patients in which the verrucae involved the penis, a 100-percent cure rate was obtained after one or two applications, but in the 2 patients whose condylomas were perianal and of long duration, partial involution only was secured. It was found impossible to avoid some irritation to the mucous membrane when the oil suspension was used, however, and unless the foreskin and glans were thoroughly washed within 24 hours after treatment there was always irritation of the surrounding tissues. Undesired



e effects varied from a peripheral halo erythema surrounding a single treated crura to extensive erythema, edema, ulceration; balanitis and phimosis o resulted occasionally.

Clinical effects were first seen within o 8 hours, the verrucae decreasing in e in 4 to 24 hours, with complete in- ution within 48 hours in some cases. eration, if present, was superficial and uted rapidly. It was decided that wash- g thoroughly within 12 hours after atment would permit therapeutic effect the drug without excessive irritation the adjacent tissues.

To reduce the irritating effects and to ke the application more penetrating, a ution of 20 percent resin of podophyl- n in 95 percent alcohol was used in the atment of 30 individuals with condylo- ta acuminata. Cures were obtained in ) percent of this group.

According to the authors, the main ect of resin of podophyllum appears to directly on the epithelial cells, two es of action being manifest, one of di- t degenerative character and the other, e production of bizarre cell forms inter- eted as distorted mitotic figures. Resin podophyllum seems to exert a profound ion on cell metabolism, it is stated. It s also noted that solutions of this drug sodium and potassium hydroxide oved inert when applied to condylomata uminata, which was taken to indicate at podophyllotoxin is probably the sub- nce in resin of podophyllum responsible its cytotoxic effect.

#### ZT. WCHNSCHR., BERLIN

Value of Hoffman's lymph-node puncture in the diagnosis of early syphilis. (Der diagnostische wert der Erich Hoffmanns- chen lymphdrüsenpunktion bei frischer syphilis.) H. Wilde. 1 : 93-94, Aug. 15, 1946. [Abstracted in Brit. J. Ven. Dis., London, 23 : 95, June 1947.]

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#### COMPT. REND. SOC. DE BIOL., PARIS

Generalized experimental rabbit syphilis. C. Levaditi and A. Vaisman. 140 : 971-973, Dec. 1946.

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#### J. A. M. A., CHICAGO

Development and use of BAL. A review, with particular reference to arsenical dermatitis. Marion H. Sulzberger and Rudolf L. Baer. 133 : 293-296, Feb. 1, 1947.

Streptomycin. New and Nonofficial Reme- dies. Council on Pharmacy and Chem- istry. 133 : 320-321, Feb. 1, 1947.

Treatment of concurrent cardiovascular and neurosyphilis. Queries and Minor Notes. 134 : 1141, July 26, 1947.

\*Prophylaxis against ophthalmia neonato- rum. Clinical comparison of penicillin and silver nitrate: a preliminary report. H. Charles Franklin. 134 : 1230-1235, Aug. 9, 1947.

Caronamide for increasing penicillin plasma concentrations in man. J. William Cros- son, William P. Boger, Christopher C. Shaw and A. Katherine Miller. 134 : 1528-1532, Aug. 30, 1947.

\*The eligibility of syphilitic persons for life insurance. Joseph Earle Moore and Ira Leo Schamberg. 134 : 1532-1535, Aug. 30, 1947.

The management of syphilis. Special Ar- ticles. 134 : 1535-1540, Aug. 30, 1947.

Incidence of venereal disease in the Army. Foreign Letters. 134 : 1562, Aug. 30, 1947.

Blood sedimentation rate in syphilis. Que- ries and Minor Notes. 135 : 131, Sept. 13, 1947.

Spontaneous cure of syphilis. Queries and Minor Notes. 135 : 131, Sept. 13, 1947.

Sulfonamides for local application deleted from N. N. R. Council on Pharmacy and Chemistry. Report of the Council. 135 : 157-158, Sept. 20, 1947.

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A photographic display of venereal diseases. Foreign Letters. London. 135 : 241, Sept. 27, 1947.

Possible syphilis with liver involvement. Queries and Minor Notes. 135 : 259-260, Sept. 27, 1947.

Prophylaxis against ophthalmia neonatorum. Louis Lehrfeld. Correspondence. 135: 306, Oct. 4, 1947.

\*Keratitis associated with lymphogranuloma venereum. Harold G. Scheie, Alan S. Crandall and Werner Henle. 135: 333-339, Oct. 11, 1947.

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Dementia paralytica treated with penicillin. Foreign Letters. Buenos Aires. 135: 373, Oct. 11, 1947.

Medical conditions in Alaska. A report by a group sent by the American Medical Association. Harry Barnett, Jack Fields, George Milles, Joseph Silverstein and Arthur Bernstein. Special Article. 135: 500-510, Oct. 25, 1947.

"Liquid" versus "solid" penicillin in oil and wax. The effect of particle size and type of penicillin. Harry F. Dowling, Monroe J. Romansky, Henry Welch, Jay A. Robinson, Velma L. Chandler, William W. Zeller and Harold L. Hirsh. 135: 567-569, Nov. 1, 1947.

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Streptomycin. Council on Pharmacy and Chemistry. 135: 839, Nov. 29, 1947.

Summary survey of state legislation of interest to physicians. George E. Hall. 135: 845-856, Nov. 29, 1947.

Latent syphilis. Queries and Minor Notes. 135: 956, Dec. 6, 1947.

Prevention of venereal diseases. Charles Walter Clarke. The Interim Session, American Medical Association, Cleveland, Jan. 5-8, 1948. 135: 993-1008, Dec. 13, 1947.

Treatment of syphilis. Queries and Minor Notes. 135: 1041, Dec. 13, 1947.

**Prophylaxis against ophthalmia neonatorum. Clinical comparison of penicillin and silver nitrate: a preliminary report.** H. Charles Franklin. J. A. M. A., 134: 1230-1235, 1947.

The author reviews the literature on the treatment of ophthalmia neonatorum, which indicates that penicillin in therapeutic concentrations is noninjurious to the eye in infections such as gonorrheal ophthalmia. A study is presented in this connection evaluating clinically the use

of penicillin in the form of drops: prophylaxis against ophthalmia neonatorum as compared with silver nitrate as commonly used for this purpose.

At the John Gaston Hospital, Memphis, Tenn., penicillin was used for prophylaxis over a 4-month period beginning July 1946, while silver nitrate was used over a 3-month period. Penicillin was used in the form of crystalline sodium salt penicillin, with a concentration of 2,500 units per cubic centimeter of diluent. The silver nitrate used was a 1-percent solution in distilled water, fresh solution made each day being dispensed in a nipp bottle.

Prophylaxis of the eyes of each newborn infant was carried out in the delivery room within 1 hour of birth. The eyes were flushed thoroughly with 2 or 3 drops of sterile isotonic solution of sodium chloride or sterile distilled water, and a drop of penicillin solution was instilled into the conjunctival sac of each eye. A single drop of penicillin was also instilled daily in each eye for the first 3 days of life. Prophylaxis with silver nitrate was carried out in the delivery room, one drop of silver nitrate being instilled after flushing the eyes with sterile distilled water.

A total of 1,710 infants (961 with penicillin and 749 with silver nitrate prophylaxis) was studied in the nursery. Of 961 infants, 2.1 percent exhibited pus in one or both eyes during or after penicillin prophylaxis, while 6.0 percent of the infants exhibited pus after silver nitrate instillation. Gonococcal conjunctivitis developed in one premature infant in the silver nitrate group, but it was not seen in any of the infants receiving penicillin drops. In the nursery, pus occurred approximately one-third as frequently and other abnormalities, such as swelling of the eyelids, redness, and watery discharge, were less frequent in the penicillin group than in the silver nitrate group.

Of the infants discharged to their homes, a complete follow-up was possible on 717 (74.6 percent) of the 961 penicillin-treated infants and on 499 (66.6 percent) of the 749 silver-nitrate-treated infants. While at home, a higher percentage

those in the penicillin group exhibited pus and other abnormalities of the eye than of the silver nitrate group, 4 from the former and 2 from the latter group being hospitalized. No cases of gonococcal conjunctivitis in either group developed during the first 2 weeks at home.

Penicillin is claimed by the author to compare favorably with silver nitrate as a prophylactic agent, the advantages of penicillin over silver nitrate including the following: Elimination of danger of permanent injury to the eye; nonpainful instillation; the solution need not be made fresh each day; deterioration does not produce harmful substance; and ocular abnormalities are less frequent during the first days of life.

**The eligibility of syphilitic persons for life insurance.** Joseph Earle Moore and Ira Leo Schamberg. *J. A. M. A.*, 134: 532-535, 1947.

The authors present a policy regarding the insurability of syphilitic persons, noting that the usual actuarial approach has been to compare the mortality rate in a group of known syphilitic patients with that in the population as a whole; the data so obtained indicate that syphilis imposes an added mortality hazard ranging from 138 to 188 percent of expected mortality.

This approach is pointed out to be both inaccurate and inadequate for the following reasons: (1) The supposedly non-syphilitic population includes a number of persons with unrecognized syphilis; (2) the exact mortality due primarily or even secondarily to syphilis is not ascertainable from the cause of death on the death certificate in many instances; (3) syphilis mortality figures are not weighted by the fact that syphilis is primarily a disease of the lower socioeconomic groups which are subject to increased mortality from many other diseases; and (4) consideration is not given to the adequacy of present treatment methods, most figures being for the prearsenical era.

In the formulation of a policy, the following facts are to be considered: (1) The death rate from untreated acquired

syphilis does not become significant until 20 or more years after acquisition of the infection; (2) untreated acquired syphilis is not necessarily a fatal or even a serious disease, potentially fatal forms developing in only about 25 percent of infected persons; (3) a positive blood test is not necessarily an indication of anatomic damage from syphilis, since in at least 60 percent of such persons coming to necropsy no evidence of damage from syphilis can be found; and (4) there is no sound evidence that acquired syphilitic infection predisposes to an increased death rate from other causes.

Three alternative policies as to the insurability of syphilitic persons exist: (1) to disregard the factor of syphilis; (2) to require a routine blood test on all applicants; and (3) to decide individually the question of insurability of all persons with recognized syphilis. Employment of the third alternative, which is the method now in use, should include the following considerations: (1) No applicant with untreated syphilis in any stage should be granted insurance; (2) infected persons should have received an amount of treatment usually considered adequate, followed by a period of observation, before insurance is granted; (3) the cerebrospinal fluid of all infected persons should be shown, 2 years or more after infection, to be normal as to cell count, quantitative protein determination, complement-fixation test, and colloidal test; and (4) the physical status should be normal, with no clinical evidence of cardiovascular syphilis or neurosyphilis.

**Keratitis associated with lymphogranuloma venereum.** Harold G. Scheie, Alan S. Crandall and Werner Henle. *J. A. M. A.*, 135: 333-339, 1947.

The authors report on a type of keratitis probably pathognomonic of lymphogranuloma venereum seen in five patients with other evidence of the disease.

In a discussion of the general clinical picture of lymphogranuloma venereum, the authors present a classification of the lesions into three groups: (1) lesions from which the virus has been recovered,



such as the primary genital lesion or inguinal buboes; (2) lesions from which the virus has not been recovered but in which the supporting evidence is good, such as ulcerative colitis or salpingitis; and (3) lesions in which the supporting evidence is only circumstantial, such as pharyngitis or ocular lesions other than conjunctivitis.

The clinical signs of lymphogranuloma venereum can be supported by the following laboratory tests, which may offer confirmation or final proof of the diagnosis: (1) The Frei test; (2) the complement-fixation test; (3) biopsy; (4) recovery of the specific virus; and (5) miscellaneous laboratory findings, such as elevation of the white blood cell count and elevation of the serum proteins.

Detailed case histories are given of the five patients reported upon. It is noted that the corneal lesions were identical in each of these patients, and that vascularization was so profuse that the surface of the cornea was elevated. The corneal lesion was accompanied by a mild to moderate iridocyclitis in all cases, with the occurrence of an occasional keratic precipitate.

Although definite proof that the corneal lesions were caused by the virus of lymphogranuloma venereum could not be obtained, the supportive evidence included the following facts: (1) All the patients had positive Frei reactions; (2) four patients had involvement of inguinal lymph nodes, which was manifest in three individuals by scars of healed buboes and in the other patient by active lymphadenitis; and (3) one patient showed a strongly positive complement-fixation test.

The differential diagnosis includes marginal keratitis, trachoma, and Mooren's ulcer. The first disease can be excluded by bacteriologic studies; the second causes a bilateral lesion with much less dense vascularization of the cornea and the third, which usually occurs in older patients, is indolent and has an undetermined advancing border.

Keratitis associated with lymphogranuloma venereum involves a serious prognosis for vision, according to the authors and it is recommended that treatment be that prescribed for the systemic disease that is, the administration of sulfadiazine orally in full therapeutic doses for a period of 21 days.

## CURRENT NOTES AND REPORTS

### 1948 Meeting of the American Venereal Disease Association

In conjunction with the 1948 session of the American Medical Association, the American Venereal Disease Association (formerly The American Neisserian Medical Society) will meet in Chicago, Ill., June 20-21, 1948. The scientific program will be presented in an all-day session on Monday, June 21, and will be held in the auditorium of the Northwestern University Medical School. The business meeting, which all members are urged to attend, will be held on Sunday night, June 20, and is to be combined with

dinner at the Pearson Hotel, located near the University.

Members who have material on any of the venereal diseases suitable for presentation on the scientific program are urged to submit titles and brief abstracts to William L. Fleming, M. D., secretary, who will transmit them to the Program Committee for consideration. Maximum time allowed for presentation of a paper will be 20 minutes, and the deadline for consideration of papers for the program is March 15, 1948.

## Certification of Penicillin- or Streptomycin-Containing Drugs

The *Federal Register* of April 4, 1947 (12 F. R. 2231-2248), published the latest regulations for the certification of penicillin-containing and streptomycin-containing drugs, as authorized by the Food and Drug Administration, Federal Security Agency. Amendments to these regulations appear in the *Federal Register* for June 21, 1947 (12 F. R. 122).

A section on definitions and interpretations is included, as well as a section on general provisions, itemized as follows:

Requests for working standard and certification; information and samples required

Certification

Conditions on the effectiveness of certificates

Records of distribution

Authority to refuse certification service

New penicillin products

Fees

Exemptions for labeling

Exemptions for storage

Exemptions for processing

Exemptions for repackaging

Exemptions for manufacturing use

Exemptions for investigational use

Sodium penicillin, calcium penicillin, potassium penicillin

Penicillin in oil and wax

Penicillin ointment

Tablets buffered penicillin

Penicillin with aluminum hydroxide gel

Penicillin troches

Penicillin dental cones

Penicillin with vasoconstrictor

Penicillin for surface application

Tablets alum precipitated penicillin

Penicillin sulfonamide powder

Penicillin vaginal suppositories

Buffered crystalline penicillin

Capsules buffered penicillin with pectin hydrolysate

Streptomycin sulphate, streptomycin hydrochloride, streptomycin phosphate, streptomycin trihydrochloride calcium chloride

The Syphilis Study Section of the National Institute of Health announces a symposium, "Recent Advances in the Study of the Venereal Diseases," to be held April 8-9 in the auditorium of the Commerce Building, Washington, D. C.

All interested persons are invited to attend.

Copies of the program will be sent upon request. Address inquiries to Dr. Frank W. Reynolds, Executive Assistant, Syphilis Study Section, National Institute of Health, Bethesda 14, Md.

## Catalog of Educational Materials

"VD Educational Materials," an attractive illustrated booklet containing complete data concerning the cost, size, and use of many types of educational devices, was published recently by the Venereal Disease Education Institute, Raleigh, N. C., in cooperation with the United States Public Health Service.

The booklet catalogs a wide range of venereal disease educational materials that are available from several sources. A national committee evaluated and classified the described pamphlets, posters,

comic books, motion pictures, and radio recordings according to their individual suitability for particular audience groups and educational objectives.

Initial distribution of the booklet has been made to State, county, and city health departments, as well as to medical school libraries. Health educators and other interested individuals may obtain copies of the publication by writing to the Venereal Disease Education Institute, Raleigh, N. C.

**Cases of Syphilis and Gonorrhea Reported to the United States Public Health Service by State and Territorial Health Departments, Last Quarter Fiscal 1947 and First Quarter Fiscal 1948**

[Known military cases excluded]

Area	Syphilis										Gonorrhea							
	Primary-secondary			Early latent			Late and late latent			Congenital			Not stated					
	April-June	July-September	Trend ratio	April-June	July-September	Trend ratio	April-June	July-September	Trend ratio	April-June	July-September	Trend ratio	April-June	July-September	Trend ratio			
District 1—Total	3,803	3,260	0.86	4,495	4,345	0.97	7,920	7,241	0.91	486	475	0.98	465	319	0.69	11,064	12,646	1.14
Connecticut	92	66	0.72	101	70	0.69	175	130	0.74	19	12	(a)	65	47	0.72	279	292	1.05
Delaware	74	74	1.00	98	67	0.68	40	42	1.05	4	3	(a)	35	43	1.23	88	101	1.15
Maine	105	114	1.09	24	23	0.96	56	47	0.84	12	6	(a)	8	1	(a)	135	172	1.27
Massachusetts	218	161	0.74	96	77	0.80	448	307	0.69	49	44	0.90	0	0	(a)	846	933	1.10
New Hampshire	24	16	0.67	10	15	(a)	42	48	1.14	6	8	(a)	5	0	(a)	82	69	0.84
New Jersey	419	819	1.95	900	993	1.10	900	993	1.10	40	48	1.20	15	15	(a)	1,476	2,019	1.37
New York	1,556	1,467	0.94	1,836	1,865	1.02	4,693	4,455	0.95	205	174	0.85	83	106	1.28	5,398	6,612	1.22
New York City	1,270	1,170	0.92	1,668	1,691	1.01	3,659	3,407	0.93	140	130	0.93	14	16	(a)	5,153	6,345	1.23
Pennsylvania	1,237	1,030	0.84	1,470	1,338	0.91	4,408	1,076	0.96	139	163	1.17	204	60	0.29	2,494	2,185	0.88
Philadelphia	526	517	0.98	818	991	1.21	657	672	1.02	44	39	0.89	85	74	0.87	1,823	2,351	1.29
Philadelphia	152	185	1.02	150	139	0.93	217	184	0.85	14	34	(a)	0	0	(a)	271	293	1.08
Rhode Island	43	35	0.81	33	22	0.67	134	133	0.99	6	10	(a)	41	23	0.56	182	147	0.81
Vermont	35	24	0.69	8	5	(a)	24	10	0.42	6	7	(a)	9	23	(a)	84	116	1.38
District 2—Total	4,346	4,311	0.99	4,424	3,775	0.85	2,795	2,569	0.92	445	428	0.96	295	173	0.59	16,141	17,742	1.10
District of Columbia	351	334	0.95	337	339	1.01	287	317	1.10	64	37	0.58	4	6	(a)	2,987	3,520	1.18
Maryland	526	627	1.19	476	473	0.99	558	503	0.90	46	62	1.35	254	134	0.53	1,932	2,387	1.24
Baltimore	404	441	1.09	374	366	0.98	475	388	0.82	17	37	(a)	38	29	0.76	1,475	1,816	1.23
North Carolina	1,062	994	0.94	825	731	0.89	297	253	0.85	94	101	1.07	0	0	(a)	3,473	3,755	1.08
South Carolina	839	904	1.08	1,212	924	0.75	402	374	0.93	60	67	1.12	3	0	(a)	2,813	3,200	1.14
Virginia	1,052	847	0.81	1,213	924	0.75	789	600	0.76	122	96	0.79	37	33	0.89	3,443	3,460	1.00
West Virginia	516	605	1.17	361	394	1.09	462	522	1.13	59	65	1.10	0	0	(a)	1,493	1,440	0.96
District 3—Total	4,581	4,003	0.87	5,108	4,637	0.91	6,989	6,375	0.91	598	557	0.93	764	573	0.75	15,583	17,718	1.14
Illinois	1,378	1,174	0.85	1,584	1,305	0.82	2,054	1,877	0.91	138	136	0.99	0	0	(a)	7,427	8,526	1.15
Chicago	980	790	0.81	1,198	1,065	0.91	1,403	1,176	0.84	91	91	1.00	0	0	(a)	6,009	6,821	1.14
Indiana	521	475	0.91	353	385	1.09	761	644	0.85	80	65	0.81	86	0	(a)	576	676	1.18
Kentucky	645	603	0.93	407	387	0.95	498	503	1.01	60	52	0.87	216	162	0.75	2,135	2,270	1.06
Michigan	737	778	1.06	919	961	1.05	1,566	1,473	0.94	121	118	0.98	461	407	0.88	2,530	3,009	1.19
Ohio	1,152	886	0.75	1,717	1,446	0.84	1,844	1,587	0.86	182	156	0.86	0	0	(a)	2,584	2,675	1.04
Wisconsin	118	88	0.75	128	153	1.20	266	291	1.09	17	30	(a)	1	4	(a)	331	392	1.09
District 4—Total	6,823	6,312	0.93	8,225	8,250	1.00	7,238	8,905	1.23	922	999	1.08	2,013	1,803	0.90	27,917	28,789	1.03
Alabama	878	823	0.94	1,004	1,649	1.03	1,979	2,081	1.05	110	103	0.94	1,511	1,229	0.81	2,403	2,255	0.94
Mississippi	660	567	0.86	767	1,254	1.90	871	2,503	2.87	140	293	2.09	1,511	1,229	0.81	1,728	2,038	1.18



Mississippi-----	1,226	981	.80	1,425	1,008	.71	930	594	.64	278	147	.53	0	0	1.46	5,220	3,887	.74
Tennessee-----	864	780	.90	1,106	959	.87	774	788	1.02	64	63	.98	24	35	1.46	6,385	7,283	1.14
District 5--Total-----																		
Arizona-----	1,777	1,617	.91	1,857	1,614	.87	3,068	2,852	.93	242	209	.86	300	187	.62	9,712	10,635	1.10
California-----	1,288	1,208	.94	1,570	1,361	.87	2,471	2,286	.93	19	10	(a)	0	0	.42	7,619	8,345	1.10
Nevada-----	60	51	.85	0	0	.77	90	77	.86	3	3	(a)	48	31	.65	132	162	1.23
Oregon-----	92	86	.93	55	41	.75	146	103	.71	14	2	(a)	47	48	1.09	458	522	1.14
Washington-----	150	122	.81	109	103	.94	179	149	.83	9	12	(a)	38	26	.68	795	895	1.13
Alaska-----	14	12	(a)	13	10	(a)	10	9	(a)	0	0	(a)	2	1	(a)	151	158	1.05
Hawaii-----	18	22	(a)	22	39	1.77	55	174	3.16	12	27	(a)	7	11	(a)	163	189	1.16
District 6--Total-----																		
Puerto Rico-----	277	217	.78	1,077	951	.88	484	425	.88	463	312	.67	23	18	.78	2,170	1,858	.86
Virgin Islands-----	262	208	.79	1,055	908	.86	476	418	.88	461	312	.68	23	5	.22	2,093	1,820	.87
District 7--Total-----																		
Iowa-----	1,384	1,095	.79	1,189	1,169	.98	1,658	1,619	.98	151	162	1.07	199	202	1.02	3,379	3,570	1.06
Kansas-----	173	170	.98	131	177	1.35	196	313	1.60	17	36	(a)	26	33	1.27	351	431	1.23
Minnesota-----	139	178	.89	147	165	1.12	272	352	1.29	35	34	.97	0	0	(a)	608	607	1.00
Missouri-----	670	477	.71	661	608	.92	737	586	.80	66	59	.89	51	65	1.27	1,662	1,603	.96
St. Louis-----	397	241	.61	451	400	.89	496	385	.78	39	37	.95	0	0	(a)	1,045	1,019	.98
Nebraska-----	129	88	.68	140	110	.79	215	152	.71	15	7	(a)	113	85	.75	200	225	1.12
North Dakota-----	28	54	1.93	8	15	(a)	16	22	(a)	6	9	(a)	5	6	(a)	54	97	1.80
South Dakota-----	53	47	.89	47	36	.77	27	31	1.15	2	7	(a)	1	1	(a)	125	162	1.30
District 8--Total-----																		
Colorado-----	339	310	.91	235	231	.98	449	420	.94	38	48	1.26	51	33	.65	846	965	1.14
Idaho-----	154	116	.75	109	112	1.03	191	160	.84	16	20	(a)	0	0	(a)	483	609	1.26
Montana-----	79	81	1.03	28	20	.71	20	36	1.12	7	12	(a)	10	18	(a)	141	145	1.03
Utah-----	38	29	.76	25	22	.88	85	68	.80	8	9	(a)	32	9	.28	89	75	.84
Wyoming-----	21	24	1.14	14	8	(a)	23	11	.48	2	0	(a)	9	6	(a)	98	87	.89
District 9--Total-----																		
New Mexico-----	1,263	1,432	1.13	1,850	1,909	1.03	1,421	1,471	1.04	265	279	1.05	1,082	2,328	2.15	8,541	10,110	1.18
Oklahoma-----	105	123	1.17	143	137	.96	111	162	1.46	27	40	1.48	1	0	(a)	329	385	1.17
Texas-----	322	344	1.07	403	496	1.23	731	681	.93	74	77	1.04	93	89	.96	2,075	2,572	1.24
Canal Zone-----	836	965	1.15	1,304	1,276	.98	579	628	1.08	164	162	.99	988	2,239	2.27	6,137	7,153	1.17
Total continental United States-----	24,284	22,306	.92	27,348	25,884	.95	31,473	31,276	.99	3,135	3,130	1.00	5,160	5,606	1.09	92,869	101,828	1.10
Total United States and Territories-----	24,601	22,566	.92	28,488	26,900	.94	32,082	31,901	.99	3,612	3,470	.96	5,202	5,637	1.08	95,589	104,192	1.09

<sup>a</sup> Ratio not calculated when base is less than 20.<sup>b</sup> Up-State morbidity estimated on the basis of clinic and in-patient care facilities' admissions.<sup>c</sup> Data from VM-820.

Source: Form 8058-B USPHS--Venereal Disease Division, Office of Statistics 12/31/47 (ML-MC) mfjm.



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FEDERAL SECURITY AGENCY  
UNITED STATES PUBLIC HEALTH SERVICE



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THOMAS PARRAN, *Surgeon General*

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Approved by the Director, Bureau of the Budget, as required by  
Rule 42 of the Joint Committee on Printing



UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.  
Price 10 cents. Subscription price: domestic, 75 cents a year; foreign \$1.15

## Editorial

The continuous evaluation of certain intensive treatment schedules for early syphilis, as conducted by the Venereal Disease Division of the United States Public Health Service and cooperating rapid treatment centers, is now reaching the point where conclusions may be drawn as to which of these schedules are the most effective and desirable. From this study and from studies conducted by other research groups, physicians may now select one or more intensive treatment schedules which promise a reasonably high rate of favorable clinical and serologic response, with reasonable safety.

We are pleased to present in this issue of the JOURNAL OF VENEREAL DISEASE INFORMATION the latest study in the Division's series of progressive evaluation reports.

Penicillin was a new drug in the treatment of syphilis in 1943. Its total possibilities were unexplored. The exigencies of the war years accelerated its use far beyond what its adaptation might have been under normal conditions. There were advantages and disadvantages in this acceleration. Several early treatment schedules were used and later discarded as ineffectual, but the accumulated data made available for evaluation presented a surer footing on which to proceed.

Statistical evaluation methods also had to be adapted to the new and different factors introduced by rapid therapy. The method used by the Venereal Disease Division is designed to adjust for the progressive loss of patients from observation and for the continuous addition of new patients to the series.

Another of the problems encountered in any evaluation of results of therapy for early syphilis is the difficulty in differentiating between clinical relapse and reinfection. This series includes under cumulative percent re-treated those cases classified as "probable reinfections," for the following reason. In the absence of a rigid criterion for differentiating relapses from reinfections, medical officers employed varying individual criteria in classifying cases found to have infectious lesions during the posttreatment observation period. Because of these variations, any break-down between relapse and reinfection would be biased by differences in clinical judgment and would not reflect either the true relapse or true reinfection rate. Such a situation will exist until definite knowledge, gained through experience and research, will permit uniformity in setting up standards.

*(Continued on page 123)*

# Syphilitic Relapse vs. Reinfection<sup>1</sup>

Ira Leo Schamberg, M. D.,<sup>2</sup> and Howard P. Steiger, M. D.<sup>3</sup>

There is today no unanimity among syphilologists regarding the criteria for differentiation between syphilitic relapse and reinfection.<sup>4</sup> As pointed out by Shaffer (1), and by Schoch and Alexander (2), the rigid standards set up in the past for the diagnosis of reinfection have been questioned in recent years as a result of observations of patients treated intensively (1, 2, 3, 4, 5). In one contribution (4), the various criteria which have been utilized are critically reviewed. It is contended that many of these criteria are no longer valid, and that differentiation between relapse and reinfection rests "on clinical impressions, on diagnostic 'hunch,' rather than on certainty."

Differentiation is not only important from the scientific standpoint of understanding more clearly the immunologic relationships in a chronic disease such as syphilis, but is also vitally necessary in studying new treatment schemes. Since relapse comprises absolute evidence of failure of the treatment given, and since

reinfection is believed by many syphilologists to indicate cure of the original infection, evaluation of the therapeutic efficacy of new methods of treatment requires differentiation between these two entities. When they are lumped together simply as "treatment failures" the investigator says, in effect, "This proportion of our total cases either was almost certainly cured or was definitely not cured. Such a group is almost worthless in contributing to the evaluation of a given treatment regimen. From the point of view of the protection of public health both relapse and reinfection represent failures, of course, in that every case of infectious syphilis endangers the uninfected portion of the population. The treatment itself, however, should not be charged with a "failure" which is actually a reinfection.

## Factors in Reinfection

The proportion of treatment failures which are actually reinfections in a series of patients. Some of the factors involved are:

1. *Degree of promiscuity.*—The more promiscuous the patient, the greater will be his chance of reinfection.

2. *Prevalence of infectious syphilis in the community.*—The more infectious syphilis in circulation, the more likely is each sexual act to result in infection.

3. *Adquacy and speed of contact investigation and case finding.*—If the source of initial infection or the contacts infected by the patient are promptly placed under treatment, renewed contact by the treated patient with any of these persons may result in reinfection.

<sup>1</sup> Baltimore Rapid Treatment Center, Baltimore, Md., and the Institute for the Study of Venereal Disease, University of Pennsylvania and United States Public Health Service cooperating, and the Penicillin-Syphilis Panel of the University Hospital. The Institute, the Departments of Neurology, Ophthalmology, Dermatology and Syphilology, and Pediatrics, Philadelphia City Department of Public Health; and the Philadelphia General Hospital, Pennsylvania Hospital, and Children's Hospital are represented in the authorship.

<sup>2</sup> Philadelphia, Pa.

<sup>3</sup> Charlotte, N. C.

<sup>4</sup> Superinfection, a second syphilitic infection superimposed on an uncured previous infection, can be diagnosed in man only when a darkfield-positive early lesion is found in a patient with unmistakably active late syphilitic lesions. If it occurs otherwise, it cannot be recognized. This paper does not consider the problem of superinfection.



4. *Therapeutic efficacy of the treatment scheme employed.*—The less effective the treatment, the larger the number of infectious relapses, and the smaller the proportion of reinfections in the total number of cases presenting new lesions. It should be pointed out, however, that this may be considered as adding indirectly to the number of reinfections as well as to the number of relapses, since patients with infectious relapse increase the amount of infectious syphilis present in the community at any given time.

It has been shown in the experimental animal (6, 7) that successful reinoculation can be carried out in animals cured early in the course of infection (treatment started within 45 days after inoculation). Arnold, Mahoney, and Cutler recently demonstrated that rabbits with early syphilis, which had been treated with adequate doses of penicillin, could be successfully reinoculated and infected with the homologous strain of *Treponema pallidum* as soon as 10 days after the completion of therapy. Thirty percent of the rabbits developed a new lesion at the site of the second inoculation. The remaining animals did not acquire a new lesion, but did develop systemic disease which was confirmed by blood transfer. Thus, it has been proved that reinfection in the rabbit can occur even after the first infection.

The study of Halley and Wassermann strongly suggests that a similar situation exists in man, but inasmuch as this study was carried out in the days of long-term treatment, it did not provide an answer to the question as to how soon reinfection in human beings can occur after the first infection.

The study of Rose, György, and Ingraham (10) on the penicillin treatment of the syphilitic infant suggests by inference that in the adult, relapse may play a lesser role than is commonly supposed, and reinfection a more important one, in the group of treatment failures after penicillin or other intensive therapy. These authors found only 1 clinical relapse among

36 infants treated, and this relapse was in an infant receiving a small amount of penicillin.

### Suggestions for Differentiation

In large groups of patients treated by identical intensive methods, several statistical devices may be used in estimating the relative importance of reinfection and relapse in the failure group. Several studies (11, 12) have demonstrated the higher rate of cure in primary than in secondary syphilis. In patients treated identically by fairly adequate measures one would, therefore, expect fewer relapses in the primary stage. If, then, significantly more "failures" were found in patients treated for primary syphilis than in those treated for secondary syphilis in a given series of patients, reinfection may reasonably be considered to be the cause of the new lesions in an appreciable percentage of cases. It has been suggested by Rosahn (13) that comparison of the failure rates in groups of patients treated by an identical method in different geographic areas in which the prevalence of infectious syphilis and the degree of promiscuity vary widely, would perhaps reveal the relative importance of reinfection in the so-called failure group.

On considering methods of differentiation in the individual patient, the authors are in agreement with Schoch and Alexander (14) that, currently, the most valid criteria of syphilitic reinfection in patients who have been treated for early infectious syphilis are as follows:

1. *Serologic course.*—Appearance of a darkfield-positive lesion morphologically compatible with a chancre while the patient is seronegative or while the serologic titer is declining, with development of seropositivity or an upward swing of the titer following the appearance of the lesion. Serologic relapse usually precedes infectious relapse. This standard, however, is applicable only to patients seen at frequent intervals after treatment and who present themselves soon after the appearance of a *primary* lesion.

2. *Response to re-treatment.*—In order to simplify the comparison of response to therapy, the patient should, ideally, be re-treated for a second infectious episode by the same treatment scheme that was used for the first infection. It would be expected that an identical, repeated course of treatment would again fail to cure in true infectious relapse.

3. *Epidemiologic evidence.*—Sexual exposure to a person with infectious syphilitic lesions is followed after the proper incubation period by a darkfield-positive lesion. In addition, we consider the following factor of importance:

4. *Adequacy of treatment of preceding episode.*—When an infectious syphilitic episode follows a small amount of therapy, relapse is the more likely cause, reinfection less likely. An effective treatment schedule makes relapse less likely, and therefore suggests reinfection.

The utilization of the criterion of serologic course demands frequent quantitative tests in a single laboratory whose procedures are subject to minimal technical variations. The failure of many patients to return for frequent and regular posttreatment observations and the variability in sensitivity of tests used by many laboratories limit the value of this method. Epidemiologic investigation depends, of course, primarily on the history obtained from the patient and his contact and is, therefore, liable to errors. It becomes apparent then that these aids may not be available or sufficiently detailed in each case. However, when reinfection is suspected, the result of re-treatment with the same amount of penicillin is indeed helpful in making the diagnosis if adequate posttreatment follow-up is carried out. The authors believe that re-treatment with identical amounts of penicillin should be utilized more frequently as a method of differentiating relapse from reinfection (see fig. 3).

In studying an individual patient, each of these criteria must be weighed and evaluated in relation to the others. The diagnosis of relapse or of reinfection demands positive evidence, and in the absence of specific data such as those outlined above, no differentiation should be attempted. When differentiation is impossible because of inadequate data, we propose the term "infectious syphilitic episode" as a noncommittal diagnosis (rather than treatment failure, which states that the treatment has failed).

### Clinical Data

This study is based on the records of patients treated at the Institute for the Study of Venereal Disease of the University of Pennsylvania and at the Baltimore Rapid Treatment Center. The lesions of all patients were darkfield-positive for *T. pallidum* on each admission to the hospital for treatment and re-treatment. The cases represented in table 1 and in figure 2 were treated at the Baltimore Rapid Treatment Center, and the remainder at the University of Pennsylvania. All cases originating from the latter institution had darkfield examinations confirmed by two trained observers. Penicillin was administered intramuscularly in aqueous solution at 2- to 3-hour intervals around-the-clock in from 4 to 15 days.

In figures 1 through 6, multiple infectious syphilitic episodes in married couples are represented in graphic form. The type and duration of infectious lesions, the time and amount of treatment, the number of courses administered, the quantitative serologic picture, and the opportunity for marital coitus are presented chronologically. The subtitle of each figure presents our interpretation of the course of events pictured in the graphic. On the basis of the criteria discussed above, we feel that the marital partners shown in figures 1 through 5 experienced reinfection of the "ping-pong" variety from an outside source, rather than infectious relapse.

Table 1.—Clinical, serologic, and epidemiologic data in patients presenting two infectious syphilitic episodes

Case	Age	Race	Sex	Diagnosis of lesions of first episode	Interval between first and second episodes (months)	Stated duration of lesions in infectious contact <sup>1</sup> at time of coitus with patient		Diagnosis of lesions of second episode	Interval between coitus with infectious contact and onset of infectious lesions in patient		Serologic test for syphilis (Eagle)		
						First coitus after patient's first treatment (days)	Last coitus before patient's second treatment (days)		First post-treatment coitus (days)	Last coitus (days)	First episode	Interim	Second episode
1. E. V.-----	21	White	Male	Primary syphilis.	7	?	31	Primary syphilis.	?	31	16 units-----	Not done-----	Negative 4 days after onset. 8 units 27 days after onset.
2. A. D.-----	33	Negro	do	Secondary syphilis.	3	1	12	do	19	8	32 units-----	6 units-----	4 units 14 days after onset.
3. R. S.-----	25	do	do	Primary syphilis.	7	7	7	do	28	28	Positive-----	16 units 1½ units.	12 units 3 days after onset.
4. D. M.-----	27	White	Female	do	7	?	100	Secondary syphilis.	?	104	8 units-----	4 units doubtful, negative, 64 units.	64 units 28 days after onset.
5. J. S.-----	21	do	Male	Secondary syphilis.	8	2	2	Primary syphilis.	9	9	96 units-----	Not done-----	48 units 36 days after onset.

<sup>1</sup> All contacts were found on examination to have infectious syphilitic lesions.



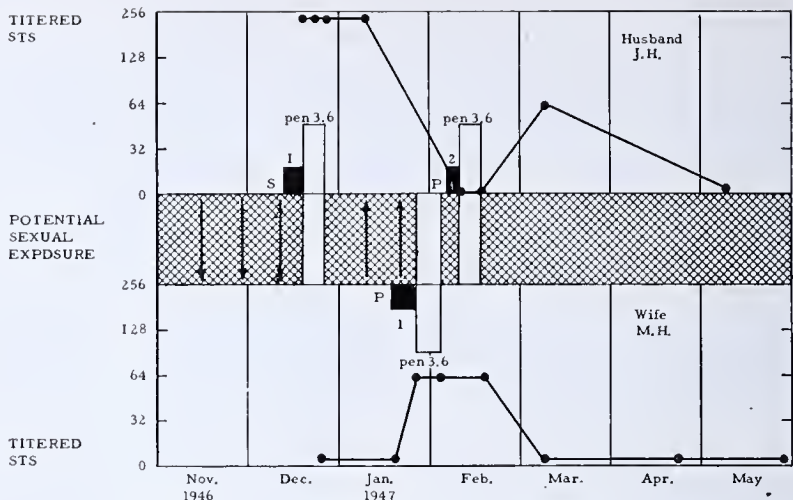


FIGURE 1.—(See opposite page for explanation.)

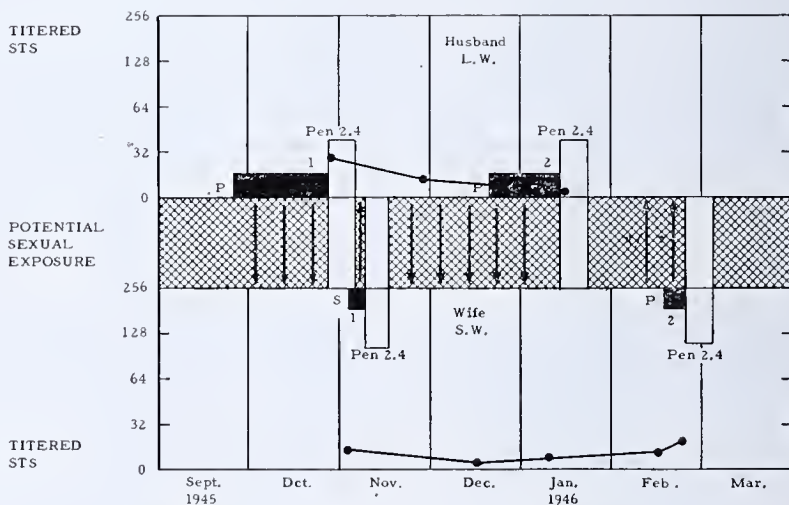


FIGURE 2.—(See opposite page for explanation.)

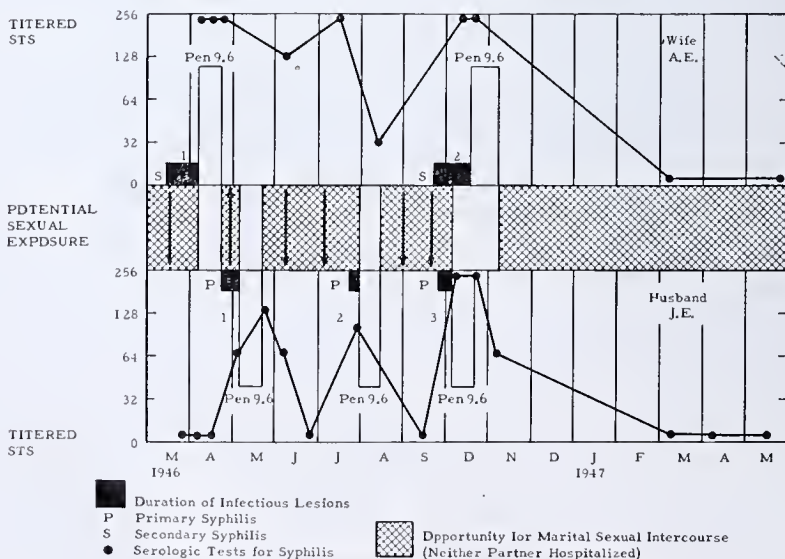


FIGURE 3.—(See opposite page for explanation.)

FIGURE 1.—J. H., husband; M. H., wife. Treatment in each instance consisted of 3,600,000 units of penicillin.

*episode 1 (J. H.):* Secondary syphilis 12/12/46; treated 12/19 to 12/26. He infected her prior to his treatment 1; was reinfected by her after his treatment 1.

*episode 1 (M. H.):* Primary syphilis 1/24/47; treated 1/28 to 2/4. Coitus between her treatment 1 and his treatment 2 denied; subsequent clinical and serologic course of both partners corroborates this.

*episode 2 (J. H.):* Primary syphilis 2/7/47; treated 2/8 to 2/15.

NOTE: STS of husband and wife, taken simultaneously in March 1947, may have been interchanged. This would explain his apparent serorelapse followed by seronegativity and her unusually rapid decline from a high serologic level to a negative STS in less than 1 month.

FIGURE 2.—L. W., husband; S. W., wife. Treatment in each instance: penicillin 2,400,000 units plus mapharsen 2/3 mg. per kg. body weight daily for 8 days, plus bismuth.

*episode 1 (L. W.):* Primary syphilis 9/27/45; treated 10/27 to 11/4. He infected her prior to his treatment 1; was reinfected by her following this treatment. Coitus twice between his treatment 1 and her treatment 1.

*episode 1 (S. W.):* Secondary syphilis 11/3/45; treated 11/8 to 11/16. He reinfected her following her treatment 1. Frequent coitus between her treatment 1 and his treatment 2.

*episode 2 (L. W.):* Primary syphilis 12/21/45; treated 1/14 to 1/22/46.

*episode 2 (S. W.):* Primary syphilis 2/16/46; treated 2/22 to 3/2.

*episode 2 (L. W. and S. W.):* Subsequent course is not known, but additional infectious syphilitic episodes appear likely, in view of the statement coitus occurred twice between his treatment 2 and her treatment 2.

FIGURE 3.—J. E., husband; A. E., wife. Both partners received 9,600,000 units of penicillin in each treatment.

*episode 1 (A. E.):* Secondary syphilis 3/15/46; treated 4/5 to 4/20. She infected him prior to her treatment 1, may have been reinfected by him after her treatment (see note below).

*episode 1 (J. E.):* Primary syphilis 4/23/46; treated 5/3 to 5/19. Reinfected after this treatment 1.

*episode 2 (J. E.):* Primary syphilis 7/23/46; treated 7/31 to 8/15. Again reinfected after his treatment 2.

*episode 3 (J. E.):* Primary syphilis 9/26/46; treated 10/4 to 10/19.

*episode 2 (A. E.):* Secondary syphilis 9/25/46; treated 10/17 to 11/1.

Following simultaneous treatment (husband's episode 3 and wife's episode 2) no evidence of new lesions in either partner during 7 months' observation.

NOTE: The long interval between the wife's episodes 1 and 2 may be only apparent, as she may have understated the duration of the lesions of episode 2. It is also possible that she was reinfected extramaritally, or that the husband's episode 2 was an extramarital reinfection, following which he reinfected her.

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NOTE: Direction of arrows in figures indicates direction of transmission.

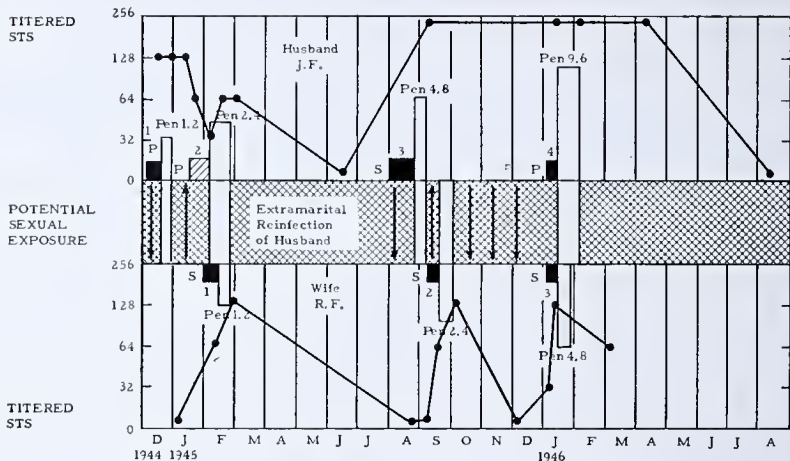


FIGURE 4.—(See opposite page for explanation.)

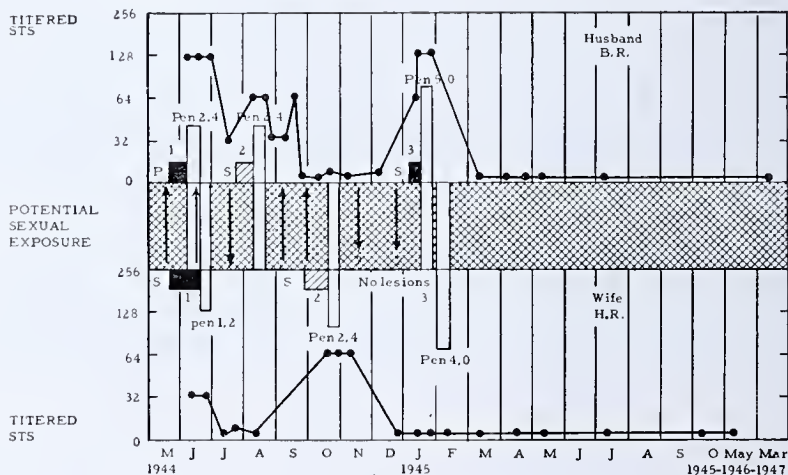


FIGURE 5.—(See opposite page for explanation.)

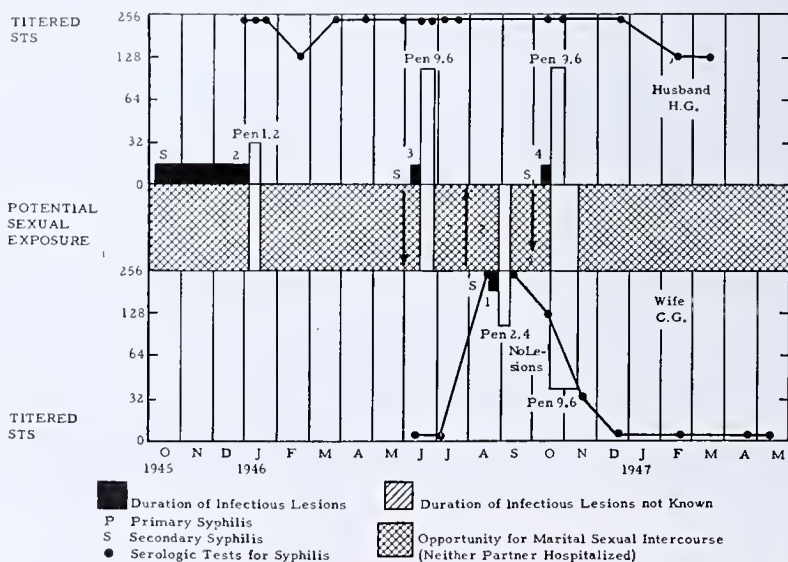


FIGURE 6.—(See opposite page for explanation.)



URE 4.—J. F., husband; R. F., wife. Treatment for both: (treatment 1) 1,200,000 units of penicillin; (treatment 2) 2,400,000 units; (treatment 3) 4,800,000 units. Treatment 4, husband only, 9,600,000 units.

isode 1 (J. F.): Primary syphilis 12/2/44; treated 12/23 to 12/30. He infected her before his treatment 1; was reinfected by her after his treatment 1.

isode 2 (J. F.): Primary syphilis; treated 2/12 to 2/24/45. (Simultaneous treatment.)

isode 1 (R. F.): Secondary syphilis 1/31/45; treated 2/16 to 2/24. (Simultaneous treatment.)

isode 3 (J. F.): Secondary syphilis 7/31/45; treated 8/31 to 9/8. Probably a reinfection by extramarital contact; wife then reinfected him.

isode 2 (R. F.): Secondary syphilis 9/17/45; treated 9/25 to 10/2. She reinfected him just before this treatment.

isode 3 (R. F.): Secondary syphilis 1/2/46; treated 1/19 to 1/26. (Simultaneous treatment.)

isode 4 (J. F.): Primary syphilis 1/3/46; treated 1/19 to 2/3. (Simultaneous treatment.)

URE 5.—B. R., husband; H. R., wife. All treatments penicillin only.

isode 1 (B. R.): Primary syphilis 5/22/44; treated 6/8 to 6/15; 2,400,000 units. He probably infected him originally.

isode 1 (H. R.): Secondary syphilis 5/25/44; treated 6/15 to 6/23; 1,200,000 units. He received his last injection of penicillin at 3 a. m., 6/15; she received her first injection at 4:30 p. m., 6/15. It is our belief that coitus within this brief 13½-hour period resulted in his reinfection.

isode 2 (B. R.): Secondary syphilis; treated 8/10 to 8/15; 2,400,000 units. He infected her before his treatment 2, was in turn reinfected by her after this treatment.

isode 2 (H. R.): Secondary syphilis; treated 10/21 to 10/29; 2,400,000 units. She may have been reinfected following her treatment 2, and cured by her treatment 2, or she may have escaped reinfection after her treatment 2.

isode 3 (B. R.): Secondary syphilis 1/8/45; treated 1/18 to 1/25, 5,000,000 units.

Treatment 3 (H. R.): Treated prophylactically (no clinical or serologic evidence) 1/29 to 2/4/45; 4,000,000 units.

URE 6.—H. G., husband; C. G., wife. All treatments penicillin only.

isode 1 (H. G.): Primary syphilis; treated in Army December 1944; 2,400,000 units penicillin (not shown in figure); seropositive 7 months later.

isode 2 (H. G.): Secondary syphilis with hepatitis and jaundice 10/3/45; treated 10/3 to 1/11/46. Probably infectious relapse (see text), though other contacts were admitted.

isode 3 (H. G.): Secondary syphilis 6/6/46; treated 6/11 to 6/26; 9,600,000 units. Married 6/7/46, but premarital coitus occurred. She was infected by him prior to his treatment 3.

isode 1 (C. G.): Secondary syphilis 8/23/46; treated 8/28 to 9/5; 2,400,000 units.

isode 4 (H. G.): Secondary syphilis 10/11/46; treated 10/15 to 10/30; 9,600,000 units. Possibly infectious relapse (see text).

Treatment 2 (C. G.): Treated prophylactically (no clinical or serologic evidence) 10/18 to 11/12/46; 9,600,000 units. Simultaneous treatment with husband's episode 4.

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NOTE: Direction of arrows in figures indicates direction of transmission.

The couple depicted in figure 3 presents striking evidence of reinfection in view of the following facts:

1. The total of 9,600,000 units of penicillin given in each course is four times the amount used in the large Army series reported by Pillsbury (15) and is considerably greater than the dosage schedule of most clinics at the present time.

2. The serologic response to treatment was favorable in each instance, and after the quantitative titer was observed to reach or approach seronegativity, an upswing was noted at the time of appearance of lesions of infectious syphilis.

3. In each treatment the same amount of penicillin was given. Although the earlier treatments were followed by infectious syphilitic episodes, the last treatment, given to the marital partners simultaneously, resulted in clinical and serologic negativity.

4. Opportunity for reinfection was maximal in that both marital partners averred repeatedly that sexual intercourse was indulged in nightly during the period under study, except when one or the other was hospitalized.

The husband in figure 1 presents evidence for reinfection in that he was seronegative at the time of onset of his dark-field-positive primary lesion of episode 2. Schoch and Alexander (14) have emphasized that serorelapse preceding clinical lesions speaks for infectious relapse, and that clinical lesions preceding a rise in titer speak for reinfection.

The husband in figure 4 may not have actually maintained a high serologic titer between episodes 3 and 4, despite the appearance of the curve. After a lapse from observation for over 4 months he returned with a penile lesion of 2 weeks' duration (episode 4), and may well have shown a favorable posttreatment serologic response followed by an upswing in his serologic titer. Had he not returned for serologic testing between episodes 2 and 3, the curve would suggest not only seroresistance, but an actual rising titer after

treatment, rather than the drop to seronegativity which is seen in the figure.

Infectious relapse is suggested by the course of events in figure 6; lack of clinical, serologic, and epidemiologic data following his initial treatment in the Army precluded a diagnosis of the husband's episode 2. We feel, however, that episode 3 was a relapse in view of the sustained high serologic titer following treatment; the relatively small amount of penicillin given; and the fact that at the time this treatment was given, penicillin K, now known to be the least treponemocidal of the penicillin fractions, was present in considerable amounts in the commercial product. As pointed out by Stokes, Beerman, and Ingraham (16), an individual who relapses once is much more likely to relapse again. This lends weight to the possibility that episode 3 may also have been a relapse, in spite of the administration of 9.6 million units of penicillin for episode 3. Should the husband relapse again after treatment 4, it is probable, of course, that the wife would be reinfected.

Table 1 indicates that according to the histories of both the patients and the contacts, which were considered fairly reliable, the contacts had lesions of early syphilis at the time of intercourse with the patients. The interval between contact with the contacts and the second appearance of lesions in the patients is consonant with our knowledge of the incubation period of early syphilis. In case No. 1, in which the incubation period was 10 days, the patient presented secondary syphilitic lesions on examination. In the other cases, the new lesion was in the primary stage. Case No. 1 presented additional evidence of reinfection in that the serologic test for syphilis was negative 4 days after the onset of his lesion, and then became positive.

## Discussion

Multiple reinfection in marital partners such as is exemplified by figures 1 through 5 has been aptly termed "ping-pong syphilis" by Schoch. The infection is bat-

back and forth like a ping-pong ball, from the infectious partner to the partner who has just completed treatment. Ping-pong syphilis is a phenomenon peculiar to short-term therapy. The marital partner of an individual undergoing prolonged treatment usually becomes noninfectious by virtue of time alone before the patient emerges from the chemical protection of treatment.

There are many social and psychological elements which are conducive to reinfection. Syphilis is usually acquired in adolescence or in early adult life, at a period when sexual activity is at its peak. The patient with early syphilis, confined to hospital for penicillin or other intensive treatment, usually not ill and not physically active, is subjected to complete sexual abstinence for one to two weeks. Following discharge from the hospital, it is evident that much self-control is needed to continue abstinence or to use mechanical prophylaxis, even if he (or she) has been advised by the physician, nurse, or social worker regarding the danger of reinfection from a possibly infected spouse. All too often patients are inadequately instructed regarding the dangers of reinfection, and others cannot or will not accept the advice given.

Although penicillin is a relatively harmless drug, it has recently been shown by Salisbury, Steiger, and Gibson (17) that the incidence of reactions to the drug increases with repeated courses. The husband in figure 3 experienced no reaction to penicillin in his first treatment, but developed severe urticaria on re-treatment.

Another danger in misinterpreting reinfection as relapse is also exemplified by the husband in figure 3. Following his second "failure," it was suggested by members of the staff that fever therapy or prolonged arsenoxide treatment be substituted for penicillin in his third course of treatment, on the basis that since he had relapsed twice after 9,600,000 units of penicillin, there was no point in giving it a third time. Dangerous and costly measures to supplement treatment

were avoided when reinfection was considered as an explanation of the patient's multiple infectious syphilitic episodes.

There is an acute shortage of hospital beds, particularly for venereal disease patients, in most communities at the present time. The extra hospital beds and the time taken up in re-treating these patients could be used far more profitably. One must also consider the cost of repeated courses of penicillin. For the couple presented in figure 3, a total of 47 days of hospitalization was taken up in re-treatment. At the present cost of about \$7.00 per day, this amounted to \$329 for the additional hospitalization. The cost of the penicillin was approximately \$115, and the patients lost an estimated \$282 in salary during the 47 days. The total cost, not including physician's fees and laboratory fees, was \$726. It is believed that the extra expenditure could have been eliminated had sexual exposure between April 20 and May 3 (a period of 13 days) been prevented by one of the methods discussed below.

Prevention of reinfection of the spouse following intensive therapy might be accomplished in a number of ways:

1. More intensive and speedy epidemiologic investigation.
2. Intensification of education during the hospitalization period in an effort to prevent or minimize post-treatment exposures.
3. Quarantine of the patient in the hospital following treatment until the spouse has passed through the incubation period. Hospitalization of the spouse, if found infected, before the patient is released. This procedure does not appear to be feasible.
4. Ambulatory arsenotherapy of a married person with early syphilis until it can be determined whether or not the marital partner has been infected. If both are infected, treat with penicillin simultaneously.
5. When exposure of the marital partner has been such as to render infection highly probable, simultaneous treatment of both might be considered



in spite of the fact that one partner is still undiagnosed. This is especially applicable when the family lives in an area remote from specialized medical service.

Despite its importance epidemiologically, simultaneous treatment of the husband and wife presents a problem when there are young children in the home. Disciplinary difficulties may also arise if both husband and wife are in the same hospital at the same time. Community measures to provide care of the children would indeed be helpful in such cases.

### Summary and Conclusions

1. The following criteria are presented for the diagnosis of syphilitic reinfection in individuals previously treated for early syphilis:

(a) Clinical evidence of a second infection precedes serologic evidence.

(b) Similarity in clinical and serologic response to each identical treatment course.

(c) Epidemiologic evidence.

(d) The more vigorous the treatment of the initial episode, the more likely is reinfection, and the less likely is relapse.

2. Evidence is presented to show that reinfection is a relatively frequent occurrence in patients subjected to short-term treatment regimens for early syphilis. The reasons for the occurrence of reinfection, the complications, and the cost in money and hospital beds are presented. The prevention of reinfection, especially the ping-pong variety, is discussed.

3. Emphasis is placed upon epidemiology, and the following epidemiologic standards for reinfection are set forth:

(a) Sexual intercourse (after treatment) with an individual who has been examined and diagnosed as having infectious syphilis.

(b) Demonstration, by history from both patient and contact, of the presence of infectious lesions in the contact at the time of intercourse with patient.

(c) An incubation period of proportionate length between the time of sexual intercourse with the infectious contact and the reappearance of lesions in patient.

4. The phrase, infectious syphilitic episode, is suggested as a noncommittal diagnosis when differentiation between infectious relapse and reinfection cannot be made. The term, "treatment failure" as used to include both clinical relapse and reinfection, is inappropriate because reinfection does not indicate inadequate therapy.

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## Rapid Treatment of Early Syphilis: Progress Report December 1947

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This report is the ninth in a continuing series of progress reports evaluating the effectiveness of various forms of rapid therapy for early syphilis. Treatment and follow-up data have been furnished by 50 State and locally sponsored rapid treatment centers.

The present report is limited to schedules utilizing penicillin, either alone or combined with arsenoxide, with arsenic acid and bismuth, or with fever therapy, and includes seven schedules not previously shown.

### Comparative Results of Therapy

Results of therapy at 12 to 15 months after treatment for 22 schedules utilizing penicillin for previously untreated secondary syphilis are presented in table 1.

At least 50 patients in each schedule were observed for as long as the period of time shown. Results of therapy are measured by cumulative percentage of cases re-treated (including reinfection, clinical relapse, and serorelapse or resistance) and by percentage of patients attaining seronegativity.

Table 2 shows which differences in re-treatment rates among the schedules presented in table 1 are statistically significant (at the 5-percent level). Lack of an entry in the square at the intersection of a column and a line means there is no significant difference in the two schedules involved. When a letter is recorded in the intersection, it means that of the two schedules compared, the schedule indicated by that letter has a significantly lower re-treatment rate.

The schedule with the lowest cumulative re-treatment rate (4.3 percent) and the highest rate of seronegativity (80.5

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Table 1.—Results of therapy 12 to 15 months following treatment for secondary syphilis in rapid treatment centers

Schedule of therapy	Total cases observed for 12-15 months	Cumulative percent re-treated	Not re-treated			
			Seropositive		Seronegative	
			Number	Percent	Number	Percent
Penicillin (aqueous) only:						
600,000 u., 10,000 every 3 hrs.....	197	32.9	25	12.7	107	54.
1,200,000 u., 20,000 every 3 hrs.....	135	25.4	16	11.8	85	62.
1,200,000 u., 40,000 every 3 hrs.....	148	22.4	14	9.4	101	68.
1,200,000 u., 40,000 every 6 hrs.....	326	23.2	63	19.3	187	57.
1,600,000 u., 20,000 every 3 hrs.....	211	21.4	51	24.2	115	54.
1,700,000 u., 20,000 every 2 hrs.....	53	19.1	11	20.7	32	60.
2,400,000 u., 40,000 every 3 hrs.....	338	19.2	54	16.0	218	64.
2,400,000 u., 80,000 every 3 hrs.....	179	20.6	32	17.9	110	61.
2,800,000 u., 25,000 every 3 hrs.....	80	21.0	11	13.8	52	65.
3,400,000 u., 40,000 every 2 hrs.....	61	4.3	9	14.8	49	80.
10,000,000-25,000,000 u., 1-day intravenous drip.....	75	52.1	8	10.6	28	37.
Penicillin (peanut oil and heeswax):						
4,800,000 u., 300,000 twice daily.....	86	11.4	17	19.8	59	68.
4,800,000 u., 600,000 every 24 hrs.....	199	16.5	29	14.6	137	69.
Penicillin and arsenoxide:						
1,200,000 u., 20,000 every 3 hrs., 320 mg. arsenoxide, 40 mg. each day (8-12-0).....	462	16.9	70	15.2	314	68.
1,200,000 u., 16,667 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 3rd, 5th, 7th, and 9th days (5-12-0).....	310	15.6	78	25.2	184	59.
Penicillin, arsenoxide, and hismuth:						
600,000 u., 10,000 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on each of 8 days; 200 mg. bismuth on 1st, 5th, and 8th days (8-6-3).....	841	17.7	229	27.2	462	54.
1,200,000 u., 16,667 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 3rd, 5th, 7th, and 9th days; 200 mg. bismuth on 1st, 5th, and 9th days (5-12-3).....	1, 237	14.5	354	28.6	705	57.
1,800,000 u., 16,667 every 2 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 3rd, 5th, 7th, and 9th days; 200 mg. bismuth on 1st, 5th, and 9th days (5-18-3).....	103	16.5	22	21.4	64	62.
2,800,000 u., 25,000 every 3 hrs.; 1 mg./kg., max. 60 mg. arsenoxide on 1st, 4th, 7th, 10th, and 13th days; 200 mg. hismuth on 1st, 7th, and 13th days (5-28-3).....	248	15.6	35	14.1	174	70.
Penicillin and fever therapy:						
1,200,000 u. in 28-30 hrs.; 6 hrs. of fever sustained at 106° F.....	84	25.8	11	13.1	51	61.
2,400,000 u. in 28-30 hrs.; 6 hrs. of fever sustained at 106° F.....	51	35.6	6	11.7	27	52.
2,400,000 u., 40,000 every 3 hrs.; 3 sessions of fever of 3 hrs. each.....	57	14.7	4	7.0	45	78.

NOTE: The statistical method used in this evaluation is based on the assumption that cases which lapsed from observation will have the same experience as those which remained under observation.,

percent) is the schedule employing 3,400,000 units of aqueous penicillin (J) given in injections of 40,000 units at 2-hour intervals. As seen by table 2, the re-treatment rate for this schedule is lower than for any other schedule, and significantly lower than for all but two of the other schedules shown. It perhaps should be pointed out that the cases included in this schedule were treated at one institution and are composed primarily of young white males. The addition of cases from other centers in future reports may alter the present excellent results.

The highest re-treatment rate (52.1 percent) and the lowest rate of seronegativity (37.2 percent) are observed in the 1-day intravenous drip schedule employing from 10,000,000 to 25,000,000 units of penicillin (K).

Schedules utilizing aqueous penicillin alone in amounts ranging from 1,200,000 to 2,800,000 units and varying in total duration from 4 to 14 days show re-treatment rates ranging from 19.1 to 25.4 percent (average, 21.6 percent). When arsenoxide is given in conjunction with the penicillin (with or without bismuth)



Table 2.—Results of test of significance (at the 5-percent level) between cumulative re-treatment rates of various schedules of penicillin therapy for secondary syphilis at 12 to 15 months after treatment.

Schedule of treatment.....			A	H	G	D	E	F	O	I	J	K	L	M	N	Q	P	Q	H	S	T	U	V	
	Total cases observed.....		197	135	148	326	211	53	335	179	80	61	75	80	199	462	310	541	1237	103	248	81	51	57
		Cumulative percent re-treated....	32.9	25.4	22.4	25.2	21.4	19.1	19.2	20.6	21.0	4.3	52.1	11.4	16.5	16.9	15.6	17.7	14.5	16.5	15.6	25.8	35.6	14.7
A. 600,000 u., 10,000 every 3 hrs.....	197	32.9			C	D	E	F	G	H	J	A	L	M	N	O	P	Q	R	S				
B. 1,200,000 u., 20,000 every 3 hrs.....	135	25.4									J	H	L		N	O	P	Q		S				
C. 1,500,000 u., 40,000 every 3 hrs.....	148	22.4	C								J	C	L					Q						
D. 1,200,000 u., 40,000 every 6 hrs.....	326	25.2	D								J	D	L		N	O	P	Q		S				
E. 1,600,000 u., 20,000 every 3 hrs.....	211	21.4	E								J	E						Q				R		
F. 1,700,000 u., 20,000 every 2 hrs.....	53	19.1	F								J	F												
G. 2,400,000 u., 40,000 every 3 hrs.....	335	19.2	G								J	G						Q				G		
H. 2,400,000 u., 50,000 every 3 hrs.....	179	20.6	H								J	H						Q				H		
I. 2,500,000 u., 25,000 every 3 hrs.....	80	21.0									J	I												
J. 3,400,000 u., 40,000 every 2 hrs.....	61	4.3	J	J	J	J	J	J	J	J	J	J		J	J	J	J	J	J	J	J	J	J	
K. 16-25 000 000 u. Intravenous drip.....	75	52.1	A	B	C	D	E	F	G	H	I	J	L	M	N	O	P	Q	R	S	T		A	
L. 4,200,000 u. P.O.B., 500,000 u. twice daily.....	80	11.4	L	L	L	L						L									L	L		
M. 4,500,000 u. P.O.B., 500,000 u. every 24 hrs.....	199	16.5	M								J	M										M		
N. 1,200,000 u. (20,000 u. every 3 hrs.) and 320 mg. arsenic oxide.....	462	16.9	N	N		N					J	N									N	N		
O. 1,200,000 u. (16,667 u. every 3 hrs.) and 1 mg./kg. max. 50 mg. 1% arsenic oxide.....	310	15.6	O	O		O					J	O									O	O		
P. 600,000 u. (10,000 u. every 3 hrs.) and 1 mg./kg. max. 50 mg. 1% arsenic oxide and 600 mg. bismuth.....	541	17.7	P	P		P					J	P						Q				P		
Q. 1,200,000 u. (16,667 u. every 3 hrs.) and 1 mg./kg. max. 50 mg. 1% arsenic oxide and 600 mg. bismuth.....	1,237	14.5	Q	Q	Q	Q	Q	Q	Q		J	Q					Q				Q	Q		
R. 1,200,000 u. (16,667 u. every 2 hrs.) and 1 mg./kg. max. 50 mg. 1% arsenic oxide and 600 mg. bismuth.....	103	16.5	R								J	R										R		
S. 2,400,000 u. (25,000 u. every 3 hrs.) and 1 mg./kg. max. 50 mg. 1% arsenic oxide and 600 mg. bismuth.....	248	15.6	S	S		S					J	S									S	S		
T. 1,200,000 u. in 24-30 hrs., 6 hrs. of fever sustained at 100° F.....	81	25.8									J	T	L		N	O		Q		S				
U. 2 (100,000 u. in 24-30 hrs., 6 hrs. of fever sustained at 100° F.....	51	35.6							O	H	J		L	M	N	O	P	Q	R	S				
V. 2 (100,000 u. (10,000 u. every 3 hrs.) 3 solutions of fever of 3 hrs. each.....	57	14.7	V									V										V	V	

Notes: Lack of entry in the square at the intersection of a column and a line means there is no significant difference in the two schedules involved. When a letter is recorded in the intersection, it means that of the two schedules compared, the one indicated by that letter has a significantly lower re-treatment rate.



re-treatment rates are consistently lower, ranging from 14.5 to 17.7 percent (average, 15.9 percent).

Unfortunately, no valid comparisons can be made between aqueous penicillin and penicillin in oil-beeswax because of the difference in the total number of units administered. However, the second lowest cumulative re-treatment rate (11.4 percent) among all schedules is observed in patients treated with 4,800,000 units of penicillin in oil-beeswax administered in injections of 300,000 units twice daily. When the same total amount of penicillin is given in single daily injections of 4,800,000 units, the re-treatment rate is 16.5 percent. The difference between the two is not statistically significant. The combined rate for these two schedules (15.1 percent) is approximately the same as the combined rate for schedules employing arsenoxide in conjunction with aqueous penicillin (15.9 percent).

One of the most interesting observations in this comparison of treatment schedules is the poor results attained in schedules in which the total amount of penicillin was administered in 30 hours or less, that is, 1,200,000 or 2,400,000 units in 28 to 30 hours plus 6 hours of fever therapy, and 10,000,000 to 25,000,000 units by 1-day intravenous drip. This finding is substantiated by a comparison of the two schedules employing 2,400,000 units of penicillin in conjunction with fever therapy. In one, the penicillin was administered in 28 to 30 hours; in the other, the total duration of treatment was 8 days. The re-treatment rates for the two schedules are 35.6 and 14.7 percent, respectively, and the percentage of patients attaining seronegativity, 52.6 and 64 percent, respectively. Although the number of cases in each group is small (51 and 57), the differences are statistically significant. As observed in previous reports, little or no difference is noted in day and 8-day schedules when the total amount of penicillin is constant. It would appear, therefore, that there is a point between 30 hours and 4 days below which it is not safe to reduce the duration of penicillin therapy.

## Reactions to Rapid Therapy

Table 3 shows severe reactions and deaths reported by 36 rapid treatment centers from July 1946 through November 1947, and includes only those schedules which employ aqueous sodium penicillin and penicillin in oil-beeswax, with and without arsenoxide. Reaction rates apply to all cases treated, regardless of diagnosis.

**Table 3.—Severe reactions and deaths reported by 36 rapid treatment centers from July 1946 through November 1947**

Type of treatment	Total cases treated	Severe reactions		Number of treatment deaths
		Number	Rate per 1,000	
Aqueous penicillin.....	32,719	206	6.3	0
Penicillin in oil-beeswax.....	11,015	34	3.1	0
Aqueous penicillin with arsenoxide.....	88,202	1,402	15.9	15
Penicillin in oil-beeswax with arsenoxide.....	30,342	230	7.6	1
Total.....	162,278	1,872	11.5	16

Severe reactions include temperature above 104° F., exfoliative dermatitis, hemorrhagic encephalitis, and other reactions which, in the opinion of the medical officer, are severe.

The relative safety of schedules using penicillin alone as compared with schedules combining arsenoxide with penicillin is shown by the following facts. There were no fatalities when penicillin was used without arsenoxide. The severe reaction rate per 1,000 patients treated was only 6.3 for aqueous penicillin used alone, and 3.1 for penicillin in oil-beeswax. A total of 16 treatment deaths occurred when arsenoxide was used with penicillin: the rate was 1 death for every 5,900 patients treated with arsenoxide combined with aqueous penicillin; and 1 death for every 30,300 patients treated with arsenoxide combined with penicillin in oil-beeswax. The severe reaction rate was 15.9 per 1,000 patients treated with arsen-



oxide combined with aqueous penicillin, and 7.6 per 1,000 patients treated with arsenoxide combined with penicillin in oil-beeswax.

Hemorrhagic encephalitis was the principal cause of death among those treatment methods utilizing arsenoxide combined with penicillin.

## Delta Plantation Case-Finding Survey in Leflore County Mississippi

A. L. Gray, M. D.;<sup>1</sup> Mary Sim Ferguson, R. N.;<sup>2</sup> and Richard S. Hibbets<sup>3</sup>

On February 17, 1947, the Mississippi State Board of Health, in cooperation with the Leflore County Health Department and the United States Public Health Service, began a venereal disease survey to determine the feasibility and effectiveness of screen physical examinations (inspection of skin and genitalia) combined with blood testing as a case-finding technique in a heavy-prevalence area. The Mississippi Delta plantation area was selected for this survey because of the high incidence of venereal disease among its non-white population. This report describes the project as it was carried out in Leflore County, Miss., where operations were initially concentrated because the county is centrally located in the Delta area and contains the Delta Medical Center (rapid treatment center), which was used as the base of operations.

### Organization and Methods

Economy and practicality were important aims. An over-all plan of organization was devised to insure close cooperation between the survey staff, county health department, State Board of Health,

and the United States Public Health Service. The State Board of Health assume the responsibility of the initial organizational planning and operation.

An intensive educational and informational campaign was continuously directed toward the nonwhite population in the county. Films, pamphlets, lectures, radio broadcasts, and the newspapers were used to inform this group about the symptoms of venereal disease and the need for speedy diagnosis and treatment. The brightly colored comic book, *Little Willie*, (1) with its effective message about syphilis, was widely distributed.

Mobile units, operated by two teams, were used to move through the plantations on schedules carefully planned to allow blood testing, examinations, and contact investigation to be done among the nonwhite tenants and workers with the least possible interference with plantation working arrangements. Although the survey was directed toward Negroes between the ages of 12 and 50, blood tests and screen physical examinations, whenever feasible, were done for anyone who requested them.

The survey organization consisted of 14 persons, and functioned as a unit. It comprised the project supervisor, a public relations officer, 2 nurses, 2 medical technicians, 2 medical assistants, 2 venereal disease investigators, and 4 clerks.

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<sup>2</sup> Administrative Assistant, U. S. Public Health Service.

<sup>3</sup> Health Program Representative, U. S. Public Health Service.

The project supervisor was responsible for the over-all operation of the survey, and for the efficient coordination of all phases. Training and experience in administrative and medical fields and in other projects of this type were necessary qualifications for the position.

The public relations officer, or advance man, performed a dual function. He had been selected not only for promotional ability but also for his civic-mindedness and for his standing in the community. His first responsibility was to make the necessary arrangements with plantation owners so that the process of bringing in the blood-testing and examining units would take place with a minimum of time and effort. He prepared the operating schedules and maintained close liaison between the testing units, the plantation owners and managers, and the administrative section of the survey organization. His second major responsibility was to arouse public interest. He arranged for and addressed meetings in the communities and encouraged public cooperation. He conducted the informational and educational program through local newspapers, the radio station, and other agencies.

After the advance preparations had been completed, mobile unit No. 1 moved to the plantation for blood testing and screen examination of plantation workers. This section consisted of a nurse, a medical assistant, two medical technicians, one venereal disease investigator, and two clerks. The nurse assigned to the section was in charge of its operations, and was responsible to the project supervisor.

The persons to be tested were first directed to the clerks, who filled out the laboratory slips; then to the medical technicians, who obtained the blood specimens; and finally to the medical assistant, who gave the screen physical examinations. When clinical evidence of gonorrhea was found, 300,000 units of penicillin in oil-beeswax were administered immediately by the medical assistant. If an individual had suspicious lesions, he was referred to the venereal disease investigator, interviewed for contacts, and then

sent to the rapid treatment center for final diagnosis and treatment. At the conclusion of each day's testing, the blood specimens were sent to the State health department laboratory in Jackson, Miss., where the Mazzini test was performed.

Approximately a week after unit No. 1 had taken the blood specimens and had given the screen examinations, mobile unit No. 2 moved in to carry on the work of follow-up. This section included the nurse-in-charge, a medical assistant, a venereal disease investigator, and a clerk. Prior to moving to the plantation, these staff members had reviewed the results of the laboratory tests obtained by mobile unit No. 1. While stationed at the plantation, unit No. 2 interviewed and examined persons with positive or doubtful blood test results, obtained additional blood specimens whenever necessary, referred apparently infected persons to the rapid treatment center, and brought in contacts of infected persons for examination. The venereal disease investigator did not have time to investigate gonorrhea contacts who were not workers on the same plantation as the informants; however, all contacts of syphilis patients were investigated either by the project investigators or by other State Board of Health investigators.

The survey administrative office was established at the Delta Medical Center. Here all activity was coordinated, serologic results were reviewed and tabulated, reports were prepared on diagnosed cases, team-operating schedules were arranged, personnel records were maintained, and supplies were issued. The clerical work in this office was done for the most part by one clerk, but if any phase of the survey operating system was overworked, any available staff member assisted until the work was in order.

A word should be said about the excellent cooperation of the private physicians. Although the majority of the syphilis cases discovered were referred to the rapid treatment center, a number of patients were treated by private physicians. All available information on such patients was forwarded to the physicians.

## National Negro Health Week

During National Negro Health Week, March 31 through April 5, 1947, the mobile units were stationed in the city of Greenwood at the request of the Greenwood Negro Civic League, other civic-minded groups of the city, and local business firms and plantation owners. These groups believed that this was an ideal opportunity to offer blood tests to every Negro citizen of Greenwood, and to demonstrate the feeling of the community toward health betterment. The week's activity assumed in part the patterns of the mass blood-test surveys as carried out in Alabama (2) and Georgia (3).

A committee of Negro citizens was formed to devise ways and means of arousing public interest. A mass meeting was held prior to the opening of the program, and at that time the problem of venereal disease was discussed and an invitation was extended to all to participate in the campaign. The local radio station was most generous with free radio time. Spot announcements were made at frequent intervals, and two 15-minute programs and several 5-minute programs were broadcast. The *Greenwood Morning Star*, the local newspaper, helped greatly in influencing the Negro citizens to report for blood tests. Prior to and during the entire survey, the newspaper carried interesting and instructive venereal disease information. A sound truck was also used to inform the community of the location and hours of operation of testing units; these announcements were interspaced with musical selections of the "boogie-woogie" type, which proved to be very effective in attracting attention. On April 1, the testing unit at the Negro high school obtained a total of 1,208 specimens. The testing units served at 18 stations throughout the city during this week.

### Results

Following this week of concentrated activity in Greenwood, the mobile units resumed their program among the planta-

tions. It became apparent that the project would require more time than had been anticipated, and it was decided to concentrate on completing the work throughout Leflore County and to terminate the survey as of June 15, 1947. Plans were also proceeding for similar surveys in other counties.

As in all experiments, there were lessons learned and valuable experience gained by the persons who participated. Even though the survey administrative office functioned satisfactorily in the Delta Medical Center, it is now believed that this office might better have been located in or near the county health department, inasmuch as all survey subjects were checked against health department records for history of previous treatment. Another point that should be noted is that although close cooperation existed between the survey organization and the county health department, coordination was somewhat hampered because no staff member of the health department was designated to perform liaison service. Consequently, there was some confusion in operating activity and some duplication in record handling which might have been avoided. The testing of blood specimens is another phase worth mentioning. The State laboratory did an excellent job in completing the tests and reporting the results to the survey; ordinarily this was accomplished in 7 hours. However, it is felt that a laboratory close to the scene of action would have expedited follow-up and diagnosis.

During the entire survey period, the mobile units visited a total of 399 plantations, and served at 18 locations in Greenwood during National Negro Health Week. Table 1 shows the results of the over-all survey activity. Of 13,618 persons who had blood tests done, 2,858 were found to have positive or doubtful results.

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<sup>4</sup>The reader may be interested in the findings on laboratory facilities in the Louisville Jefferson County demonstration (J. VEN. DISEASE INFORM., 29: 67-72, March 1948), which covered a lower prevalence area and which used different techniques.



**Table 1.—Results of venereal disease case-finding survey among nonwhite population in Leflore County,<sup>1</sup> Miss. (Delta plantation area), February 17 to June 1, 1947**

	Number	Number	Number	Percent
Plantations surveyed.....	399			
Routine male genital examinations completed.....	6,438			
Screen examinations done by request (male and female).....	897			
Total persons blood tested.....	13,618			100
Positive and doubtful.....		2,858		21
Negative.....		10,389		76
Dissatisfactory.....		371		3
Total venereal disease infections found requiring treatment.....	2,073			
Syphilis.....		1,199		100
Primary and secondary.....			54	5
Early latent.....			209	17
All other stages (with and without previous treatment).....			936	78
Gonorrhea.....		2,854		
Other venereal diseases.....		20		
Syphilis cases found adequately treated.....	1,057			

<sup>1</sup>The estimated nonwhite population of Leflore County in 1943 was 35,792.  
70 of these gonorrheal infections were found and treated on screen examination.

A total of 1,199 cases of syphilis was diagnosed, and treated; of these 54 or 5 percent were primary or secondary syphilis, and 209 or 17 percent were early latent. A total of 854 cases of gonorrhea was treated; and of this total, 770 were found through screen examinations.

Routine genital examinations were done on 6,438 males, and an additional 897 persons (male and female) were given screen examinations at their request. Table 2

**Table 2.—Final diagnosis on persons found to have lesions on screen examinations done during survey in Leflore County, Miss., February 17 to June 21, 1947**

Total persons found to have lesions in screen examinations.....	65
Final diagnosis:	
Primary and secondary syphilis.....	20
Early latent syphilis.....	3
All other syphilis.....	6
Gonorrhea.....	10
Other venereal diseases.....	10
Nonvenereal.....	16

shows the final diagnosis on 65 persons found to have suspicious lesions when examined. Twenty of the primary and secondary syphilis infections were discovered among these lesion cases.

The Mississippi State Board of Health

was interested in knowing the reactions of the plantation owners to the survey activities and whether or not they would be willing to repeat the program in the future. Each plantation owner was asked to fill out a brief questionnaire, so designed that it reflected his individual attitude. He was urged to answer the questions frankly, and was requested to submit the questionnaire unsigned to the State Board of Health. The results were very gratifying inasmuch as 98 percent of the owners expressed their approval of the project. One question referred to the therapy given plantation employees at the rapid treatment centers; 91 percent of the owners thought their employees were benefited by this treatment, 7 percent were not sure that the treatment was helpful, and 2 percent stated that their employees were not benefited. The owners were asked to indicate whether they would agree to have their employees retested in the future; 94 percent agreed. It is interesting to note that of those individuals who stated that the project interfered with plantation operation, 92 percent nevertheless agreed to have their workers retested if the project were repeated later. Many questionnaires were returned with signatures, and several letters were received expressing enthusiasm about the accomplishments of the survey.

The following is a letter received from an owner of one of the largest plantations:

Dear Doctor Gray:

I am enclosing the card with answers but am unwilling to send just the card without any comment.

I think the project was carried on in a most efficient manner and with the greatest courtesy and consideration of the employees.

I believe this program will do [much] for the Negroes of the State . . . and will make it possible for the next generation to benefit from the education they receive.

I will be glad to cooperate with you at any time for the continuation of the program.

It is believed that the survey produced an increased awareness of venereal disease symptoms, not only among employees but also among employers. The following story illustrates this point. Because of the large number of late and late latent syphilis cases found on many plantations, it was necessary to stagger such referrals to the rapid treatment center in order to provide priority for infectious cases. Arrangements were made so that at scheduled times the health department bus stopped at the plantations for the employees with late and late latent syphilis and took them to the rapid treatment center. One such trip produced two patients who could not be accounted for; they had no referral records and were not on the pick-up list. Upon investigation it was discovered that the plantation owner was responsible for their referral. Just prior to the arrival of the bus, he had noticed that the two workers had a rash, and on the basis of the information given him by the members of the survey team he surmised that the rash was caused by syphilis. Therefore, he directed the two persons with the suspicious rash to go to the rapid treatment center with the others for examination. Both cases were later diagnosed as secondary syphilis.

## Discussion

The over-all cost of the survey was approximately \$20,000. This expenditure resulted in finding 2,073 cases of venereal disease requiring treatment. Although the cost in terms of primary and secondary syphilis cases found seems high, nevertheless the project has been worthwhile in its prolonged educational effort on the people of the community. Long after the survey activity, the people of Leflore County have retained a substantial interest in and a comprehensive knowledge of their venereal disease problem. This is demonstrated in one way by the fact that Leflore County is now one of the most productive in the State in number of voluntary admissions to treatment clinics; and these patients seem to be well aware of the significance of lesions and are willing to seek diagnosis and treatment. The many patients who were treated at the rapid treatment center have brought back to their friends and associates the story of rapid treatment and now act as missionaries by influencing other persons to seek diagnosis and treatment. It is felt that the project was successful from the standpoint not only of bringing to treatment a large number of cases in a relatively short time, but also of bringing the venereal disease problem before the people of Leflore County and leaving with them a knowledge and awareness which will enable them to contribute actively to the county control program.

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# Venereal Disease Educational Program in Nebraska

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Since the spring of 1942 the State Department of Health has been planning and bringing to the citizens of Nebraska a program of education directed toward the prevention of venereal disease. This program has been presented in a majority of high schools and colleges in the State and also before an even larger number of adult groups. Although under the direct supervision of the State Division of Venereal Disease, the plan is an integral part of the over-all program of the Division of Public Health Education.

The first step taken after the program was initiated was to present prenatal and marital blood-test laws to the State legislature for passage at the 1943 session. Educators necessarily devoted considerable time to securing the support of adult groups for these two bills, which were passed as a direct result of the State-wide adult venereal disease educational program.

The objectives of the program in high schools and colleges, as well as in adult education, follow:

1. To encourage wholesome and intelligent attitudes toward the venereal diseases.
2. To give high school and college students an adequate understanding of two dangerous communicable diseases—syphilis and gonorrhea.
3. To develop an awareness of the need for and importance of education in the home, the church, and the school in order to combat the false information prevalent among young people.
4. To promote an understanding of the venereal disease educational program among teachers, school administrators, parents, women's organizations, civic groups, and church groups in order to receive their support and co-

operation in establishing such education as a part of the regular school curriculum, as well as their support of all other aspects of the venereal disease control program.

5. To endeavor to coordinate all activities in terms of a long-range, permanent program.

## *Program in Secondary Schools and Colleges*

The great need for a program of this kind was very evident and generally recognized, as a majority of the schools had no such program and had no staff member qualified to teach or to integrate the material as a regular teaching procedure in such courses as biology, physical education, and home economics. A majority of parents admitted they possessed neither the factual knowledge nor the emotional attitude toward sex which would enable them to give proper guidance to their children.

During the summer of 1943, secondary schools with an enrollment of 100 or more were asked by letter whether they desired a program of venereal disease education during the school year. The response was good, and nearly 200 secondary schools were reached with films and talks to combined groups of boys and girls during that first school year.

In the summer of 1944, letters were sent to the same schools. Their willingness to repeat the program indicated the support and approval of school authorities, as well as of parents. All but 12 of the schools asked to have the program repeated. Among the 12 were new superintendents who said they did not feel they were well enough established in their communities to undertake a program of this kind. Letters were also sent in 1944 to



smaller secondary schools, and personal visits were made to State teachers colleges and all other colleges. Since 1944, requests have come voluntarily, and it has been impossible to meet them all because schools are asking for more complete programs.

In small communities a 2-day program was held. On the first day the meetings combined groups of boys and girls. The sexes were segregated on the second day, when facts peculiar to each sex were discussed. In larger schools the work was done through the physical education classes; two meetings were held on consecutive days with all the girls and two meetings with all the boys. Both plans proved very effective, and certainly were a great improvement over a single meeting with combined groups.

A great deal of work has been done in junior high schools, always at the request of either the school authorities or parents' organizations. For example, in one of the larger cities where there are only grade schools and senior high schools, the Adult Homemaking Department of the school system, recognizing a need for such instruction, planned the program with the consent and cooperation of the parents reached through the Parent-Teachers Association. After all details were worked out, the venereal disease educators were asked to present the programs in 52 of the 56 schools.

In developing high school and college programs over the past 4 years, the procedure has been to present sound sex instruction through a discussion of boy-girl relationships, including actual questions asked by boys and girls who, in terms of their own thinking, desire information on specific life problems. Starting with the student's interest in his own relationships, and building upon that interest, knowledge of the venereal diseases can be introduced and wholesome sex attitudes emphasized.

Information about the venereal diseases includes a detailed description of the symptoms, stages, how contracted and spread, what to do if infected, the results of not being treated if infected, disabili-

ties caused by the diseases, and a discussion of congenital syphilis. Venereal disease films, slides, literature, and question-and-answer periods supplement the program.

In most schools the use of written questions by the students facilitated more frank discussions. Their questions had to do with venereal disease, prostitution, dating, petting, love, marriage, pregnancy, contraceptives, menstruation, seminal emissions, masturbation, drinking, sexual intercourse, personal hygiene, how to be attractive to the opposite sex, proper relationships with the opposite sex, and the physical and emotional changes which take place during the adolescent years.

One thousand of the students' questions were tabulated under the following general headings to show the direction of their greatest interest.

Questions on :	Number of questions	Percent of total questions
Venereal disease-----	321	32.1
Pregnancy and abortion -----	143	14.3
General feminine hygiene -----	137	13.7
Sexual relationships, premarital and marital -----	117	11.7
Dating -----	76	7.6
Petting -----	69	6.9
Contraceptives -----	53	5.3
Prostitution -----	43	4.3
General masculine hygiene -----	41	4.1
Total -----	1,000	100.0

An interesting project was accomplished through the cooperation of the University of Nebraska. Venereal disease literature was given to members of the radio classes at the University, and from this literature the students wrote and produced 12 recordings which have been used in radio stations in the State. The Department of Health has a record player which makes it possible to furnish schools with professional recordings for classroom or general assembly use. This is the outcome of many requests from schools for new methods of presentation.

## Workshops for Teachers

Through general health education workshops, sponsored by the Department of Health each summer in State normal schools and in colleges, there has been opportunity to instruct future teachers in methods of initiating well-rounded social hygiene programs as part of the regular curriculums of elementary and secondary schools.

An interesting method has been used with these groups to establish wholesome attitudes in the minds of both new and experienced teachers, and to show them the great need for such education and its importance in the schools. Questions raised on an article "Integration of Sex Character Education with the Teaching of Biology," by Margaret Stewart Funk<sup>1</sup> were used at the first meetings of the classes. Members answered and returned these questions at the end of the course. A brief summary follows of the answers given by one group, which consisted of 39 teachers of various ages.

In response to the question, "Where did you get your first information on sex?" 62 percent stated that they had first learned about sex from older children; 14 percent learned from their mothers; and 15.4 percent "had always known." The ages at which such information was obtained varied from 7 to 13 years. Experiences contributing to attitudes toward sex were: wrong impressions from parents (44 percent); wrong impressions from other children (12.8 percent); from first boy friends—good and bad impressions (10.3 percent); from advertisements and from unmarried women having children (10.3 percent); good instruction at home, church, or school (10.3 percent). The remaining 12.3 percent had no experiences.

Sixty-four percent of this group did not want their children, brothers, or sisters to repeat any of their experiences, and 10 percent had no desire for marriage

because of bad sex training. Over 92 percent felt that they did not have the type of sex education in junior or senior high school which helped to solve their many sex problems.

## Public Information

Information to the general public has been accomplished through news releases, especially those promoting the observance of Social Hygiene Day; through articles in the State Parent-Teachers Association magazine, the *Nebraska Educational Journal*, and hotel magazines; by radio broadcasts and panel discussions before welfare organizations, civic clubs, and other lay and professional groups; by distribution of literature and posters to organizations; by enlisting the aid of schools and individuals interested in this type of education; and through a general health institute, stressing social hygiene, for the Negro population in Lincoln and Omaha.

An outstanding accomplishment was a week's intensive educational campaign held in Lincoln and in Lancaster County. This was an all-out attempt to give citizens a complete picture of the venereal disease problem. The campaign was sponsored by the Junior Chamber of Commerce, Lincoln and Lancaster County Social Hygiene Association, city and State departments of health, and the Lancaster County Medical Society. Cooperating with the sponsoring agencies were schools, all large industries, hotels, taverns, drug and merchandise stores. Posters and informative literature were used by the cooperating agencies, and busses and streetcars carried posters. Radio stations cooperated by means of spot announcements during the week. Newspapers contributed editorials and presented articles by the superintendent of schools, medical authorities, and presidents of civic and other lay organizations.

In view of the fact that Nebraska is an agricultural State and sparsely settled in many areas, the following tabulation shows excellent group participation, during one representative year.

<sup>1</sup>Funk, M. S.: *Integration of Sex Character Education with the Teaching of Biology*. American Social Hygiene Assn., New York, 1938.

*Number of  
organizations Individual  
participating attendance*

Type of organization :		
Schools -----	531	81, 405
Women's organiza- tions-----	102	13, 273
O t h e r organiza- tions-----	226	6, 794
School teachers and administrators --	62	6, 067
Medical and nurs- ing -----	201	4, 429
Church-----	75	2, 729
Civic organizations--	45	1, 554
Industry -----	64	997
Total-----	1, 306	117, 248

### **Long-Range State Program**

Definite progress has been made during the past 5 years, and yet much remains to be done to achieve the one objective so important from the beginning—a long-range, permanent program for Nebraska. It is difficult to evaluate a program of this kind even though the splendid cooperation of a majority of school authorities, parents, teachers, students, organizations, and individuals has been achieved. Three high schools have made social hygiene courses compulsory; many other schools are using literature and films in special courses. Requests have increased for material which can be integrated in specific courses. The foundation has been laid but definite assurance of permanency is still the chief aim.

There are indications that development of a permanent program may result from certain unsolicited requests for cooperation from State groups such as the Nebraska Congress of Parents and Teachers and the Nebraska District YWCA's. Throughout the State 83 parent-teachers organizations asked for special venereal disease education programs; 56 organized study groups for parents; 34 were responsible for programs in their own high schools. Many groups and individuals requested free supplementary literature, films, and other materials from the State health department, and 812 homes

planned to use the Dickerson "Home Study Course in Social Hygiene for Parents,"<sup>2</sup> which was adopted by the Nebraska Congress of Parents and Teachers. The work with the District YWCA led to educational courses in summer camps and participation in conferences. These two projects resulted in joint sponsorship by the Parent-Teachers Association and the YWCA of social hygiene institutes which are held in various sections of the State. These institutes train either voluntary or paid leaders (paid through the State Vocational Education Program) to carry on social hygiene education in their own communities. The venereal disease educator is in charge of the institutes.

### **Discussion**

A few minor problems have been encountered in the venereal disease education program in Nebraska, but never has there been any direct word or letter of criticism from an organization or individual after programs have been given. Through lack of understanding of the program, and fear of repercussions from parents, some school authorities have been reluctant to accept the program. Some religious groups have caused occasional difficulties, but fortunately most of these misunderstandings have come to our attention in time to give a full and careful explanation of the purpose, methods, and means of presentation of the program. This procedure has been followed in every possible instance and it has paid dividends.

An example of decided opposition to the program came from a school superintendent and his board of education, who feared reactions of parents. Through department records it was discovered that there was a high incidence of venereal disease in this community, due mainly to wartime conditions. We had

<sup>2</sup> Dickerson, R. E.: Home Study Course in Social Hygiene Guidance for Parents. Cincinnati Social Hygiene Assn., Cincinnati, 1944.



ged that a program be given in the high school, but to no avail. Even after it was discovered that one of the senior girls, an outstanding member of her class, had been the source of a gonorrheal infection in 11 boys ranging in age from 15 to 21, the school administrators still insisted their student body did not need a program of venereal disease education. Several months later stories of the delinquency problem reached the ears of the parents. The stories grew to great proportions, until finally the Parent-Teachers Association decided to investigate. With the assistance of the State health department, the Association planned a 6-month series of general health lectures for parents, stressing social hygiene education.

At the close of the lectures the City Council of the Parent-Teachers Association appointed a committee to go before the board of education and demand that next week's social hygiene program be given in both the junior and senior high schools. The board admitted it had never been opposed to the project but had only feared repercussions from parents. This was the longest program given in any high school, and the school superintendent became one of its staunchest supporters. It has continuously been kept in mind that society has a definite responsibility in giving venereal disease education to young people. The point is stressed repeatedly with adult groups. An example

of what happened at a college illustrates this point. A talk was given, films were shown, and a question-and-answer period followed. About a month after the lectures the physical education instructor in charge of the group discovered that one of the boys was infected with gonorrhea. The student was sorry, said he knew better, and that there was no one to blame but himself. He had gone immediately to a doctor. This boy was not an outcast, and he had nothing against a society which had warned him of the dangers and, when he did not heed the warning, helped him to overcome the damage.

Youth of today is not blase and wise beyond its years. Youth knows its ignorance, but many young people have been hushed for so long and so many times that bravado is about the only reaction that could reasonably be expected from them.

In summing up, one major point which has been learned and which should be stressed is the fact that whatever is done in the field of venereal disease education must be done with the feeling that it is not likely to result in unfavorable reaction. Failure might be caused only by attempting too much too soon, thereby blocking the way for another attempt. If students, their parents, and the community are receptive because of careful planning on the part of the educators, the program will be on a safe and permanent foundation.

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## Announcement

The tenth postgraduate course in venereal diseases will be conducted at the United States Public Health Service Medical Center, Hot Springs National Park, Ark., during the period April 19 to May 1, 1948, inclusive.

This training will be available to health officers interested in the clinical aspects of venereal disease control, as well

as to physicians in private practice who have been cooperating with State and local health departments. Lectures and demonstrations will be given by specialists in the various fields of the management and control of the venereal diseases.

Further information may be obtained from the Medical Officer in Charge of the Medical Center in Hot Springs.

## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of all articles concerned with venereal diseases or related subjects which have been published in the better known journals both here and abroad during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

### AM. J. SYPH., GONOR. & VEN. DIS., ST. LOUIS

Venereal disease control during the postwar period. J. R. Heller, Jr., 31: 569-574, Nov. 1947.

\*Treatment of interstitial keratitis with particular reference to the results of penicillin therapy. Joseph V. Klauder. 31: 575-599, Nov. 1947.

\*The primary lesion of pinta. (Mal del pinto or carate.) F. León Blanco and O. de Laosa. 31: 600-609, Nov. 1947.

Action of disinfectant, chemotherapeutic, and antibiotic agents on the organism of granuloma inguinale. Geoffrey Rake and Wolcott Dunham. 31: 610-613, Nov. 1947.

Studies on the causal agent of granuloma inguinale. R. B. Dienst, C. R. Reinstein, H. S. Kupperman and R. B. Greenblatt. 31: 614-617, Nov. 1947.

\*Neurosyphilis: treatment with penicillin alone and with a combination of penicillin and malaria. Arthur C. Curtis, Robert E. Burns and Dorothy H. Norton. 31: 618-632, Nov. 1947.

Evaluation of California's prenatal law requiring a serologic test for syphilis. A. Frank Brewer and Florence E. Olson. 31: 633-639, Nov. 1947.

\*Experimental and clinical studies on oral bistrimate (sodium bismuth triglycollamate) for systemic bismuth therapy. Robert A. Lehman and David W. Fassett. 31: 640-656, Nov. 1947.

Qualitative spinal fluid protein determination. A comparative study. George W. Binkley and Herbert H. Johnson, Jr. 31: 657-660, Nov. 1947.

Financial support for medical research in the venereal diseases. Announcement. 31: 664-668, Nov. 1947.

**Treatment of interstitial keratitis with particular reference to the results of penicillin therapy.** Joseph V. Klauder. *Am. J. Syph., Gonor. & Ven. Dis.*, 31: 575-599, 1947.

The author presents a report on 59 patients with interstitial keratitis treated with penicillin. Results of treatment have been evaluated in terms of visual acuity with refraction determined at varying intervals after treatment ranging from approximately 1 to 3 years. These results are compared with the results of fever-chemotherapy without penicillin in 54 patients with active interstitial keratitis. Of the 72 patients, 50 were females; 41 of the patients were white and 31 were Negroes; ages ranged from 5½ to 46 years.

To 41 patients treated in one clinic, sodium penicillin was administered intramuscularly; at first, individual injections of 50,000 units each were administered every 4 hours to a total of 2,400,000 units; about 1 year later, the interval was changed to 3 hours with the total dosage and duration of treatment unchanged. The other 18 patients, treated in other clinics, received a total dosage of penicillin ranging from about 0.5 million units to about 4 million units, at 1-hour and 4-hour intervals. Some of the patients treated in all the clinics received local treatment with penicillin.

Penicillin was well tolerated, with no serious untoward reactions and no aggravation of the keratitis after initial treatment. In 10 of 24 patients with active unilateral keratitis at onset of treatment, the second eye became involved at intervals ranging from 6 weeks to 3 months following penicillin treatment. In 13 of the 22 patients with active unilateral keratitis at onset of treatment with fever and chemotherapy, the second

became involved at intervals ranging from 5 to 99 months after treatment. It was found that penicillin, like chemotherapy, does not prevent an initial attack of interstitial keratitis, involvement of the second eye, or recurrence of the disease in the previously infected eye.

The nonpenicillin-treated control group of 54 was compiled from hospital case records of patients who had received more than 20 injections of an arsenical, more than 50 injections of a bismuth compound, and in addition, 8 to 12 febrile paroxysms either from malaria or from vaccines given intravenously. Data were compiled also for other groups of patients who received various forms of treatment other than penicillin, such as mercury and salvarsan.

Of the penicillin-treated patients, 84.5 percent of the affected eyes had final visual acuity of 6/6 to 6/21, compared with 84.2 percent of the affected eyes of patients treated by fever and chemotherapy and 84.2 percent of affected eyes of patients treated by arsenic and mercury. The lack of striking results in the final visual acuity of penicillin-treated patients is consistent with clinical observations in which penicillin does not uniformly exert an immediately favorable effect on active interstitial keratitis. The author discusses evidence that interstitial keratitis may not be entirely a syphilitic process. With respect to systemic treatment, he points out, however, that the more recent studies show that though antisyphilitic treatment is not ideal, it does show results superior to those in untreated patients. He regards penicillin as the most effective form of treatment and believes that penicillin can displace chemotherapy.

**The primary lesion of pinta. (Mal del pinto or carate.)** F. Léon Blanco and de Laosa. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31: 600-609, 1947.

The authors state that the clinical course of pinta may be divided into three stages: a primary phase in which the initial lesion is the only skin manifestation, a secondary stage in which multiple

disseminate lesions, or pintids, become apparent, and a dyschromic phase which was the only stage known before reports by Blanco were published in 1939.

This paper deals exclusively with the primary lesion which is described as developing in two successive stages. The initial lesion at first looks like an infiltrated papule (initial lesion of the papulose phase), which subsequently changes into an erythematous squamous patch (initial lesion of the erythematous squamous phase) which varies in size with its period of evolution.

The initial lesion occurs precisely at the point of entry of the treponeme. It appears after 72 hours to 5 or 10 days, as a minute papule varying in size from that of a pinhead to that of a lentil and increases steadily in size excentrically or by the fusion of peripheral lesions which slowly become confluent, forming circular, oval, or fringed contours which for a time remain erythematous squamous. The clinical forms of this erythematous squamous phase may be classified as follows:

1. The psoriasiform type, which is most frequently observed in the early months of the disease. The lesion is sharply defined and covered with whitish scales in several varying layers. Isolated serous droplets, containing numerous treponemes, sometimes may be seen on the surface.

2. The trichophytoid type, which consists of erythematous squamous round patches separated from healthy skin by raised borders. By spontaneous partial restitution, areas of normally colored skin may be created which are divided by bands of slightly infiltrated skin. In most cases, the whole surface of the lesion shows disseminated minute follicular papules.

3. The lichenoid type, which consists of erythematous pigmented, nummular patches which are sharply defined by slightly raised borders covered with fine scales. Its outstanding feature is the presence of a checkered design due to exaggeration of natural skin folds



and the shining quality of the patch surface. Purple hues are frequently found in dark-skinned people due to the superposition of the deep pigmentation of the cutis on the erythema.

4. The type with large patches. These lesions are large, slightly squamous patches, the surface of which shows numerous scattered pigmented areas. These patches alternate with regions of atrophic skin in which smooth or squamous papules often are seen disseminated on the skin surface.

The initial lesion of the papular phase is always pruriginous to varying degrees, but in the erythematosquamous stage, the pruritis is less marked and usually intermittent. The initial lesion is found most frequently on uncovered areas of the body, particularly on the legs and dorsum of the foot, the forearm and dorsum of the hand, but also, occasionally on the face and most other parts of the body. The greatest frequency of infection is between the ages of 5 and 20 years, recent data indicate. From experimental pinta the incubation period has been determined as 3 to 10 days, or, occasionally, much longer.

While no large-scale investigations have been carried out to determine the results of serologic reactions in the primary stage of pinta, serial tests in 56 patients showed the serologic flocculation and complement-fixation tests to be negative. In 17 individuals who were experimentally infected, these reactions became positive after the appearance of secondary pintids. Since serologic tests are always negative in primary pinta, they are of no value in the diagnosis of this disease which may be assured by the demonstration of treponemes in the serous exudate of the lesions.

**Neurosyphilis: treatment with penicillin alone and with a combination of penicillin and malaria.** Arthur C. Curtis, Robert E. Burns and Dorothy H. Norton. *Am. J. Syph., Gonorr. & Ven. Dis.*, 31: 618-632, 1947.

An analysis, based upon 118 patients treated at the University of Michigan

Hospital for various forms of central nervous system syphilis and observed for a minimum of 1 year subsequent to treatment, is presented for the purpose of comparing treatment with penicillin alone against treatment with a combination of penicillin and malaria.

Of the 118 cases studied, 75 received penicillin alone and 43 received penicillin plus malaria; the combined therapy was generally administered to patients presenting the more serious clinical picture. There were 112 white and 6 Negro patients in this series, with an average age of 40.4 years.

The results for all types of central nervous system syphilis showed a 74-percent clinical and an 81-percent spinal fluid improvement following therapy in the penicillin-plus-malaria group and 51-percent clinical and a 62-percent spinal fluid improvement in the group receiving penicillin alone. When the data for those who failed to improve in the year following treatment were combined with the data for those who became worse in the first posttreatment year, it was seen that 49 percent were clinically unchanged or worse following treatment with penicillin alone and 26 percent were unchanged or worse following combined therapy. Thirty-eight percent of spinal fluids were unimproved or worse following penicillin alone compared with 19 percent after combined therapy.

No essential difference between cerebrospinal fluid response of those who received malaria and penicillin and those who received penicillin alone was seen. Patients treated with penicillin and malaria showed a rapid fall in the colloidal gold curve compared to those receiving only penicillin.

The results by type of neurosyphilis were as follows:

1. In paresis and taboparesis, 57 percent of the 30 patients receiving penicillin alone showed clinical improvement by the end of the first posttreatment year, and 64 percent of 28 patients receiving combined therapy improved in the same period. The spinal

fluids in 70 percent of the patients treated with penicillin alone and in 71 percent of those receiving combined treatment showed improvement.

2. Thirty-two patients with tabes dorsalis without paresis were treated: in all cases, regardless of therapy, the cerebrospinal fluid was either improved or unchanged by treatment. Of 9 patients who received both penicillin and malaria, 6 derived symptomatic improvement, and the others became worse or remained unchanged. The 23 patients receiving penicillin alone showed spinal fluid improvement in all cases; 13 attained symptomatic improvement, 8 were symptomatically unchanged but apparently arrested, and 2 became worse.

Thus, patients treated for tabes dorsalis exhibited no essential difference in clinical or spinal fluid improvement rates after the different therapies, and the authors feel that penicillin alone may be the treatment of choice for tabes dorsalis since it is simpler and less debilitating.

3. Eight patients with primary optic atrophy were treated and observed for at least a year. In the four receiving penicillin alone and in the four receiving combined therapy, arrest of the degenerative process seemed apparent 1 year after treatment. Optic atrophy progressed in a ninth patient within 4 months after he received combined treatment.

**Experimental and clinical studies on oral bistrimate (sodium bismuth triglycollamate) for systemic bismuth therapy.** Robert A. Lehman and David W. Fassett. *m. J. Syph., Gonorr. & Ven. Dis.*, 31: 40-656, 1947.

The authors herein report on studies related to the acute and chronic toxicity and fate of bistrimate as an agent for administering bismuth by mouth.

Bistrimate, which is readily soluble in water without hydrolysis and gives a solution which is approximately neutral in reaction, has a bismuth content of 18.30 percent, so that 1 gm. of bistrimate con-

tains the equivalent of 0.138 gm. of metallic bismuth and 0.823 gm. of disodium triglycollamate. This study reports on the toxicity of both disodium triglycollamate and bistrimate.

Several experiments are detailed. In one study on lethal dosages, using rats and mice, it was shown that, by intraperitoneal injection, the ratio of the LD<sub>50</sub> of disodium triglycollamate to bistrimate was approximately 14 to 1, whereas by oral administration, the ratio was about 2 to 1, the acute toxicity of bistrimate by this route apparently being dependent primarily on the total amount of absorbed bismuth. In another experiment to determine the magnitude of the chronic toxic dose, bistrimate was administered orally to three normal adult rabbits over a period of 7 weeks, the dosage being 2.1 mg. of bismuth per kilogram daily for the first week, with an increase so as to reach 266 mg. per kilogram during the final week. There were no signs of toxicity until the intake reached 106 mg. per kilogram, at which point, chemical analysis of liver and kidney specimens showed a high bismuth content typical of the administration of a bismuth compound at a toxic dosage level. Three control rabbits who were given equivalent oral doses of disodium triglycollamate according to the schedule used for bistrimate survived the course with no evidences of toxicity. Other studies on dogs and mice were conducted to determine fate and toxicity of bistrimate and disodium triglycollamate.

Bistrimate was administered 3 times a day at various dosage levels to 15 hospitalized individuals, 2 of whom had syphilis. A continuous daily urinary excretion of about 2 to 4 mg. of metallic bismuth was considered satisfactory as a potentially effective level, and a dose equivalent to 450 mg. of bismuth was seen almost invariably to cause a daily excretion greater than this amount. In 2 cases, treatment started at a dose of 450 mg. had to be discontinued because of anorexia; otherwise, no evidences of toxicity were observed. Five patients with syphilis, 2 with early darkfield positive



lesions, 2 with chronic ulcerations, and 1 with multiple gummas, who were treated with bistrimate, yielded responses typical of systemic bismuth therapy. Bistrimate therefore appears to be a safe and convenient means of bismuth administration, the authors conclude.

**AM. J. TROP. MED., BALTIMORE**

Types of American cutaneous leishmaniasis—dermatological aspects. [Including syphilis.] A review. Leon Goldman. 27: 561-584, Sept. 1947.

**ARCH. DERMAT. & SYPH., CHICAGO**

Penicillin in the treatment of experimental syphilis of rabbits. II. The synergistic or additive activity of penicillin, oxophenarsine hydrochloride and bismuth and potassium tartrate. John A. Kolmer. 56: 179-186, Aug. 1947.

Neurosyphilis. Treatment using penicillin alone and in combination with oxophenarsine hydrochloride and with bismuth. Herbert M. Leavitt. 56: 233-243, Aug. 1947.

\*Therapy of early syphilis with massive doses of penicillin. Herman N. Bundesen, Leo Loewe, Robert M. Craig, George X. Schwemlein, Robert L. Barton and Theodore J. Bauer. 56: 339-343, Sept. 1947.

Penicillin in the treatment of experimental syphilis of rabbits. III. The therapeutic activity of penicillin by oral administration. John A. Kolmer. 56: 344-348, Sept. 1947.

\*Prenatal syphilis. Its prevention by use of penicillin in treatment of pregnant women with early infectious syphilis. Hans C. S. Aron, Robert L. Barton and Theodore J. Bauer. 56: 349-356, Sept. 1947.

**Therapy of early syphilis with massive doses of penicillin.** Herman N. Bundesen, Leo Loewe, Robert M. Craig, George X. Schwemlein, Robert L. Barton and Theodore J. Bauer. *Arch. Dermat. & Syph.*, 56: 339-343, 1947.

The authors report on a study of 129 patients exhibiting clinical evidence of primary or secondary syphilis who were treated with 10,000,000 units of sodium penicillin administered intravenously over a 24-hour period. Of these patients, 119 were previously untreated for syphilis. The remaining 10 had received unsatisfactory treatment or had exhibited evidence of relapse after previous treatment. The maximum period of observation ranged from 7 to 11 months.

The rate of failure with this form of treatment was so high as to render unsuitable for early syphilis. The treatment was a failure for 61 of the 129 patients. Thirty-six patients lapsed from observation and it is reasonable to surmise that for some of these the treatment was a failure. In 51 of the 129 patients treated, relapse occurred in 4 months or less.

Of 15 patients presenting seronegative primary syphilis, 5 (33.3 percent) relapsed by the end of 7 months. Of 2 patients with seropositive primary syphilis who were treated, 13 (44.8 percent) relapsed by the end of 7 months, while of 85 patients with secondary syphilis 43 (50.6 percent) relapsed.

A statistical table is presented which reveals the relapse rate in the entire group at monthly intervals.

**Prenatal syphilis.** Its prevention by use of penicillin in treatment of pregnant women with early infectious syphilis. Hans C. S. Aron, Robert L. Barton and Theodore J. Bauer. *Arch. Dermat. & Syph.*, 56: 349-356, 1947.

The authors report the observations made at the Chicago Intensive Treatment Center on 36 women treated with penicillin for early infectious syphilis during pregnancy and the resulting effect on their offspring. For comparative purposes, the results are given of examinations of 28 infants delivered of a group of 28 women with early infectious syphilis during pregnancy who (before the advent of penicillin) had received intensive arsenotherapy.

Of the 36 infants delivered of mothers whose syphilis was treated with penicillin exclusively, 1 died of prolapse of the cord and asphyxia, while a second was reported stillborn, possibly because of syphilitic infection. No signs or symptoms attributable to congenital syphilis could be found in the 34 living infants. In thorough physical examinations, serologic tests, or roentgenologic studies of the long bones. Thus, the failure rate in the group was 2.8 percent.

Two case reports are presented.



others who produced infants free of syphilis despite the fact that they themselves showed mucocutaneous relapse after penicillin treatment.

In the comparable group of 28 infants delivered of women who were treated by various methods of intensive arsenotherapy, definite congenital syphilis developed in 3 infants, making the failure rate in this group 10.7 percent. The authors state, therefore, that penicillin is unquestionably the superior form of treatment of the pregnant syphilitic woman.

The results of this study were found by the authors to be in perfect agreement with previously reported studies made by investigators in Baltimore and Philadelphia. When the results for the 3 groups are summarized, there is a total of 96 infants, in 1 of whom congenital syphilis developed and 1 of whom was stillborn, making an over-all incidence of failure of 1.04 percent. Statistical data on these studies are presented in 4 tables.

At the end of their report, the authors state that before this paper was finally published, a total of 81 infants had been served by them and that, except for the stillborn infant mentioned previously, the remaining infants were free of infection to date. This reduces the failure rate for this group from 2.8 to 1.24 percent.

CHINESE M. J., SHANGHAI

\*A simple coloured slide flocculation test for the diagnosis of syphilis. Hsien-Ta Hsiang. 65: 135-144, May-June 1947.

**A simple coloured slide flocculation test for the diagnosis of syphilis.** Hsien-Ta Hsiang. Chinese M. J., 65: 135-144, 1947.

The author discusses a simple, colored, slide flocculation test which he has evolved by combining some of the good qualities of various existing tests, without sacrifice of accuracy. The procedure and results are described in detail.

Dried beef heart and egg yolk are extracted with absolute ethanol to make the antigen. One hundred milliliters of antigen contain the whole of the ether-soluble and acetone-insoluble phosphatides together with the ether-insoluble and ethanol-soluble lipoids contained in 5 gm.

of dried beef heart muscle and an equal amount of egg yolk. Sudan III, Janus green, and para-dimethylamino-azobenzol are added to color the extract. The author states that the results can be read easily, about 5 minutes after the diluted antigen has been mixed with the inactivated serums. Tests on 60 serums can be performed with 0.5 ml. of the antigen.

Indications of the various degrees of reaction are described in detail. Briefly, the appearance of red flocculi against a green background indicates positive reactions, while negative reactions are indicated if the serums remain homogeneously green. This test does not require the use of a microscope, special pipette, or slide. A constant sensitivity of the antigen may be maintained by regular titration of the antigen before use.

For comparative purposes, 1,000 serums were tested with the author's method and other tests were run with the Ide, Kahn, Wassermann, Murada, and Meinicke tests. The comparative data obtained from these tests are summarized in 5 tables. The author's method was found to be in agreement with Ide's test in 97.8 percent of the serums, with Kahn's in 96.3 percent, with Wassermann's in 93.6 percent, with Murada's in 95 percent, and with Meinicke's test in 94.3 percent.

In this series, the 545 serums on which definite information was available were classified into normal and pathologic nonsyphilitic, and treated and untreated syphilitic types. Results in this group indicate that the author's test possesses a specificity of 100 percent for the normal nonsyphilitic serums and 98.4 percent for the pathologic nonsyphilitic, while the sensitivity is 78.4 percent for the treated and 88.8 percent for the untreated syphilitic serums.

PRESSE MÉD., PARIS

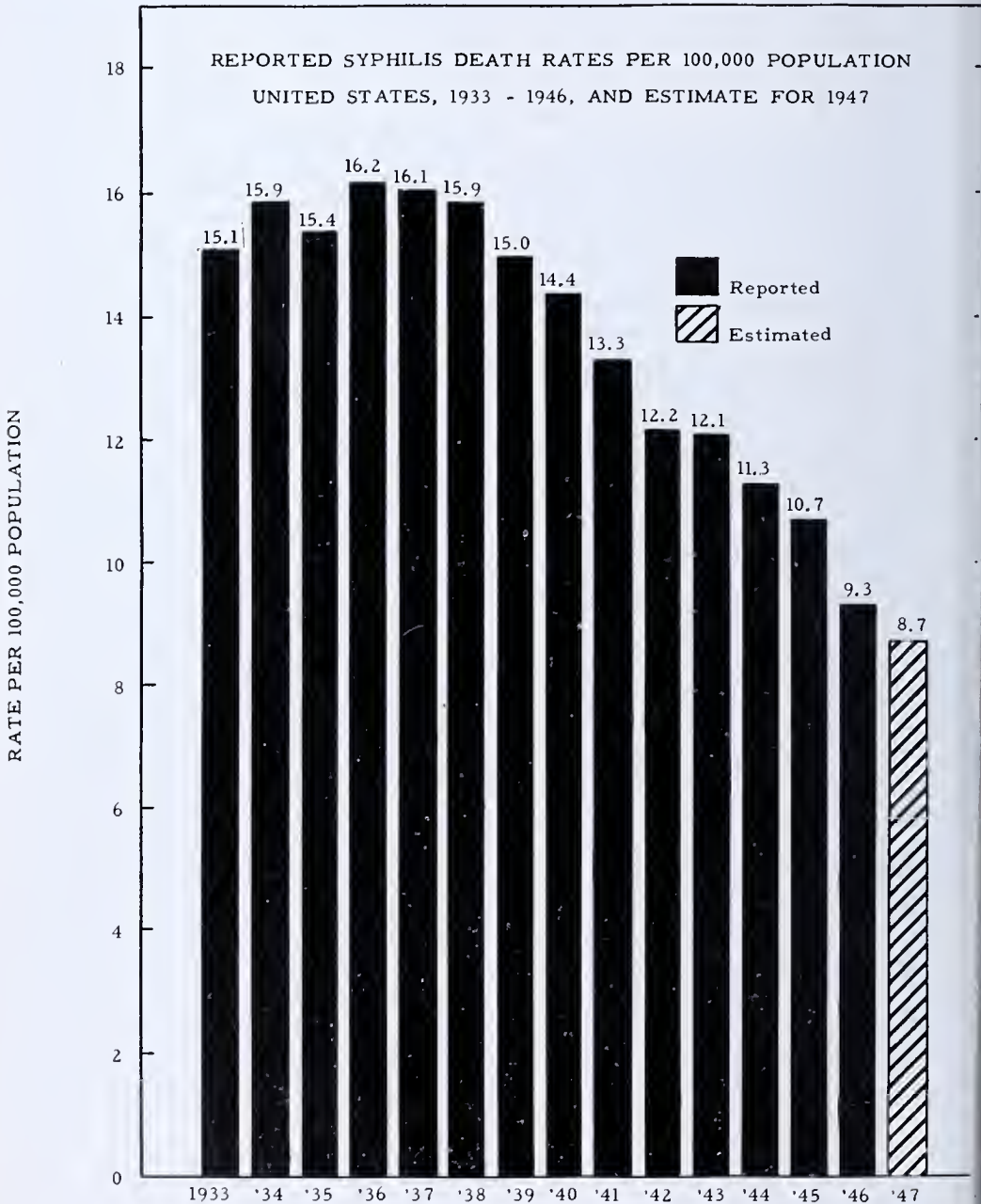
Favorable action of very prolonged cures of mercury cyanide on a syphilitic aortitis with acute pulmonary edema. 21: 295, June 5, 1943.

Prolonged treatment of syphilitic aortitis with mercury. 21: 296, June 5, 1943.

A new orientation in France on the control of venereal disease. H. Gounelle and P. Girault. 55: 47-48, 1947.

# STATISTICS

## Reported Syphilis Mortality Has Decreased For 11 Consecutive Year



Source: National Office of Vital Statistics

1933-43 Vital Statistics-Special Reports, Vol. 22, No. 1, February 28, 1945

1944-45 Vital Statistics-Special Reports, Vol. 27, No. 2, May 16, 1947.

1946 Communication on final tabulations.

1947 Estimated 10 percent sample of January-October reports. Current Mortality Analysis, October 1947.

U.S.P.H.S. Venereal Disease Division, Office of Statistics, February 3, 1948.

A special study on reinfection and clinical relapse is now under way in the Venereal Disease Division, but the results will not be available until a sufficient number of cases with satisfactory posttreatment observation has been accumulated.

Wide comparison of data is important to the successful evaluation of efficacy of drugs and technics of treatment. Analytical reports, such as Dr. Schamberg and Dr. Steiger have presented in this issue, are welcomed. Contributions from the field on all phases of the venereal diseases are more necessary now than ever before in order that the JOURNAL OF VENEREAL DISEASE INFORMATION may increase its usefulness. Printing restrictions recently have been lifted to some extent, and it is now possible to invite suggestions for improvement. The Editorial Board takes this opportunity to remind you that if the JOURNAL is to serve as a medium for exchange of new ideas, current information and studies from the field are indispensable.







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FEDERAL SECURITY AGENCY  
PUBLIC HEALTH SERVICE

**FEDERAL SECURITY AGENCY**

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**Approved by the Director, Bureau of the Budget, as required by  
Rule 42 of the Joint Committee on Printing**



**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.**  
**Price 10 cents. Subscription price: domestic, 75 cents a year; foreign \$1.15**



## New Case-Finding Aid

Venereal disease case-finding activities throughout the country will be further implemented with 10 transcribed 15-minute radio programs to be released early this summer through the Venereal Disease Division of the United States Public Health Service. These transcriptions will be distributed through district offices for use by State and community health departments engaging in intensive case-finding activities. They were produced by Columbia University under the direction of Erik Barnouw, director of Columbia's School of Radio and president of the Radio Writers' Guild.

Aimed primarily at syphilis case finding, the transcriptions deliberately de-emphasize technical information; rather, they stress when to suspect infection and where to go for treatment. The accent is on hope rather than on fear. In every plot, the unsuccessful agents of disaster are ignorance, fear, and prejudice.

Each 15-minute transcription is a complete entity. It may be used with the other transcriptions, or alone, as circumstances warrant. And, for the most part, each transcription is designed for special appeal to a particular audience; for example, sports fans, mystery-story fans, soap-opera fans, hillbilly music followers. But in every case, the objective is to motivate, directly or indirectly, persons who suspect infection to seek diagnosis and treatment.

The scripts have been prepared by some of America's best radio writers: Ben Kagan, James Erthein, Alan Lomax, Erik Barnouw, Sandra Michael, and others.

The programs will feature such well-known performers as Roy Aicuff, Raymond Massey, Margot, Eddie Albert, and Tom Glazer.

It is anticipated that the transcriptions will achieve maximum effectiveness when used as part of the publicity campaign in intensified case-finding projects. Supported by newspaper releases, billboard advertising, and all the other public appeal mediums, they will dramatize the objectives of the projects in terms of the everyday, real-life crises that attend a syphilis infection.

When the transcriptions are released to the State and local health departments, each set will be accompanied by suggested promotional material for use by the radio stations to advertise the programs. This promotion material will include publicity releases; spot announcements; a brief manual on the radio in venereal disease education; a general

*(Continued on page 155)*

# Mass Blood Testing in Eight Georgia Communities

C. D. Bowdoin, M. D., M. P. H., Director, Division of Preventable Diseases,  
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Between October 1945 and August 1947 the Georgia State health department, in cooperation with the health departments of the cities and counties involved and the United States Public Health Service, conducted mass blood-testing programs in eight communities. A total of 9,042 previously unknown cases of syphilis were discovered as a result of testing approximately 288,000 persons. This paper presents a brief description of the methods used, the results achieved, and the lessons learned from these programs.

The location and dates of the eight programs are as follows:

1. Savannah and Chatham County, October 15 through November 30, 1945.
2. Columbus and Muscogee County, May 1 through June 15, 1946.
3. Macon and Bibb County, July 8 through August 21, 1946.
4. Augusta and Richmond County, September 16 through October 30, 1946.
5. Moultrie and Colquitt County, March 5 through March 26, 1947.
6. Thomasville and Thomas County, May 1 through May 21, 1947.

7. Cairo and Grady County, June through June 18, 1947.

8. Rome and Floyd County, July through August 12, 1947.

Selective Service data had indicated high prevalence rates in most of these areas, and it was felt that programs involving the testing of large numbers of the population would prove a very profitable case-finding method and, in addition, would raise the general level of knowledge of venereal disease in these areas. An intensive publicity campaign was utilized to attract large numbers of people to testing stations, where blood for a serologic test for syphilis could be drawn. A chest X-ray for tuberculosis was taken at the same time, because it was believed that a combination of case-finding programs for the two diseases would be economical and effective. Persons showing a positive or doubtful reaction to the blood test were followed until a definite diagnosis could be established, and every infected person was aided in arranging for necessary treatment.

## General Methods

### Publicity<sup>2</sup>

In each mass blood-testing program, an intensive publicity campaign was utilized to acquaint the people with the danger of untreated syphilis, the symptoms of the disease, and the possibilities of cure. A direct and extensive appeal was made to persuade persons to participate in the testing program. Feature articles, editorials, schedules of testing stations, and full-page advertisements appeared in all

<sup>1</sup> With the statistical assistance of Quentin R. Remein, Biostatistician, Venereal Disease Division, U. S. Public Health Service.

NOTE: Beginning with the January 1948 issue of the JOURNAL OF VENEREAL DISEASE INFORMATION, reports on various case-finding demonstrations have been published, as follows: Arkansas (January issue); Oklahoma City (February issue); Louisville-Jefferson County (March issue); Leflore County, Miss. (April issue). The reader may be interested in comparing or contrasting the methods used and the problems encountered in the different areas.

cal newspapers. Radio stations broadcast dramatic sketches, spot announcements, and talks on venereal disease. The spot announcements urged listeners to: "Know for sure. Get a blood test and test X-ray from any of the conveniently located stations or from your private physician." Sound trucks were used in selected sections, with popular records played between announcements. Large street signs in brilliant colors announced at: "The treatment of early syphilis with penicillin is completed in nine days," and "Early tuberculosis can be cured." These signs were placed on lamp posts in shopping areas and at other strategic points, and posters were displayed in store windows.

A most important part of the program in each area was the splendid cooperation received from local churches and from industrial, social, and civic organizations. In each city, newspaper articles were illustrated with pictures of the mayor, members of the city council, and other prominent citizens receiving blood tests and X-rays.

### ***Blood Testing and X-ray Stations***

Temporary stations were established at strategic locations in each community to draw blood and to take X-rays. Stations were maintained in the health departments and in some store buildings for the duration of the program. Mobile stations, which changed location on prearranged and widely publicized schedules, functioned as industrial, school, and general units. The general units, usually located in churches and school buildings, tested nearby residents and civic and social groups.

### ***Laboratories and Serologic Tests***

In each of the first four programs, the initial blood tests were performed at a special laboratory set up with the assistance of the United States Public Health Service. The Mazzini serologic

test (omitting the second-drop technic) was used as a screening test; the test was adjusted for a slight increase in specificity and an accompanying slight decrease in sensitivity. Any additional tests necessary to determine a final diagnosis were performed in the laboratory of the local health department. In each of the last four programs, all blood tests were performed by a special survey laboratory in Atlanta, operated as a part of the central State laboratory.

### ***Follow-up and Examination Procedure***

All positive and doubtful serologic reports were matched against the records of persons known to be under treatment for syphilis. The persons not known to be under treatment were notified by first-class mail to report to the health department or to their local physician for further observation. Personal visits were made when letters failed to bring response. Private physicians were consulted on the manner of follow-up of persons tested by them and found to have positive or doubtful blood test results. Persons with negative blood tests were notified by letter.

When a person with a doubtful or positive test result came to the health department, he was examined by a physician, and any additional tests which might be necessary were performed. Further appointments with the examining physician were arranged, if required. Persons diagnosed as having syphilis were interviewed concerning their preferences as to treatment agencies. The advantages and availability of rapid treatment were explained to all, and transportation was provided to the nearest rapid treatment center for those persons electing to go there.

### ***Participation by Private Physicians***

The private physician occupies a strategic position in venereal disease control, as he does in any other public health pro-



gram. The participation of private physicians was an important factor in the success of these community-wide programs. The physicians' cooperation was enlisted through the local medical associations, and included endorsement of the program by medical societies in all communities. Some physicians referred people to blood-testing and X-ray stations; others drew blood specimens and sent them to the health department laboratory. The latter physicians were of course notified of the blood test results; and, where follow-up was necessary, the epidemiology section offered to perform this service. If the physician preferred to do his own follow-up, data on the disposition of the case were obtained from the physician.

### **Changes in Methods of Procedure**

As the special program developed, the experience gained made improvements possible in the technics of certain aspects. New methods were developed and used as the program progressed.

### ***Serologic Tests Employed***

In Savannah, all persons with positive or doubtful response to the initial Mazzini test (as adjusted) were requested to report to the health department for additional tests. These additional tests were performed by the health department laboratory, where the Kahn standard test was used. Because of the high sensitivity of even the adjusted Mazzini test, a relatively large proportion of persons with doubtful serologic tests but without clinical evidence of syphilis was found in the initial screening in Savannah. Therefore, because of the large volume of blood tests to be performed and because of limited facilities and personnel, it was necessary to devise a blood-testing plan which would eliminate the necessity for obtaining new samples of blood from the considerable number of persons who might be expected to be free

from syphilis infection. Such a plan was used in the later programs.

The method utilized was to perform a second test, the Kahn standard, on a portion of the original sample of blood obtained from each person whose Mazzini test result was positive or doubtful. Only those persons showing a positive or doubtful reaction to the Kahn standard test were requested to report to the health department for further observation. Thus, the demands on the laboratory and health department clinics were considerably reduced. In making this decision it was recognized that a small number of syphilis infections, which might be verified if more exhaustive laboratory testing were practicable, would probably be missed. Nevertheless, the arbitrary decision was regarded as justifiable under the pressure of circumstances.

### ***Routine Physical Examinations***

On the basis of preliminary reports of a case-finding demonstration in Oklahoma City, it was decided to include routine physical examinations in the Georgia program. At Columbus, such examinations were offered at two blood testing stations for Negroes. As a result of the 1,581 physical examinations given, 10 previously unknown cases of primary and secondary syphilis and 145 cases of gonorrhea were discovered. In a continuation of this policy in Macon, 3,251 routine physical examinations of Negroes were done, which resulted in 19 previously unknown cases of primary and secondary syphilis and 419 cases of gonorrhea being discovered. Because of difficulties in obtaining facilities and personnel, it was decided not to offer routine physical examinations at blood-testing stations of the Augusta program and of following programs.

### ***Follow-Up***

In Savannah, before follow-up was instituted in cases of positive or doubtful

ood test results, the reports were sent to the Central Registry of Venereal Diseases in Atlanta, where they were checked against the files of known and suspected cases. Because of the delay in mailing forms to and from Atlanta, the final diagnosis and disposition of cases lagged considerably behind the blood-testing activities. Therefore, in other cities, the records of the local clinics were checked for history of previous treatment.

It was found in the Savannah program that insufficient time and personnel had been budgeted for follow-up activities, and this error was corrected in later programs. Letters notifying persons to report for repeat tests were also used much more liberally in the later programs, and persons over 50 years of age were requested not to report for diagnosis until after the special program had been completed.

### **contact Investigation**

In Savannah, Columbus, and Macon, no particular effort was made to intensify the methods of contact investigation currently in use. In Augusta, however, an attempt was made to carry out complete, intensified contact investigation on all cases of primary and secondary syphilis discovered. Reports from that city indicate that intensive contact investigation conducted jointly with mass blood testing was exceptionally effective. Of the 171

cases of primary and secondary syphilis found in the Augusta program, 38 were discovered by contact investigation. Therefore, intensive contact investigation was also conducted in conjunction with the special programs following Augusta.

### **Results of the Programs**

The combined population of the several communities in which these mass blood-testing programs were held is estimated at approximately 573,000 (1943 Census Bureau estimate). A total of 288,028 persons was tested, representing approximately 50 percent of the estimated total population.

The total number of persons tested during the 8 programs, the total number of positive and doubtful results, and the total syphilis infections identified are shown in table 1. The results of the blood tests show that 39,853 persons, or 14 percent of the 285,905 persons tested (excluding those with unsatisfactory reports), had either a positive or doubtful reaction; and 26,568 persons or 9 percent of those tested were found to be infected with syphilis. Of the syphilis cases identified during the programs, approximately 1 out of 3 represented cases not previously known to treatment, and approximately 1 out of 15 of these previously unknown cases was in the primary or secondary stage.

**Table 1.—Summary of syphilis case-finding accomplishments in 8 Georgia communities**

	Number	Percent	Percent	Percent
Persons blood tested: <sup>1</sup>				
Total (positive, doubtful, negative).....	285,905	100		
Positive and doubtful results.....	39,853	14		
Syphilis infections.....	26,568	9	100	
Known to treatment.....	17,526		66	
Not previously known to treatment.....	9,042		34	100
Primary.....	169			2
Secondary.....	414			5
Early latent.....	1,851			20
Other or unknown stages.....	6,608			73

<sup>1</sup> Actually 288,028 persons accepted tests; however, 2,123 persons with unsatisfactory blood test reports are not included in this table.

Table 2.—*Syphilis case-finding accomplishments, by area, in 8 Georgia communities*

	Savannah-Chatham County 10/15-11/30/45		Columbus-Muscogee County 5/1-6/15/46		Macon-Bibb County 7/8-8/21/46		Augusta-Richmond County 9/16-10/30/46		Moultrie-Colquitt County 3/5-3/26/47		Thomasville-Thomas County 5/1-5/21/47		Cairo-Grady County 6/4-6/18/47		Rome-Floyd County 7/9-8/12/47	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
County population (1943 Census Bureau estimate)-----	150,000	-----	97,300	-----	101,800	-----	88,870	-----	30,900	-----	34,000	-----	17,000	-----	53,200	-----
Percent tested of total population-----	48	-----	55	-----	52	-----	42	-----	54	-----	52	-----	51	-----	54	-----
Percent tested of population in age group 15-50 years-----	157	-----	167	-----	165	-----	149	-----	(2)	-----	(2)	-----	(2)	-----	(2)	-----
Persons blood tested (excluding those with unsatisfactory reports):																
Total (positive, doubtful, negative results)-----	70,743	100	52,665	100	53,043	100	37,258	100	17,131	100	17,536	100	8,668	100	28,861	100
Positive results-----	12,404	18	5,089	10	4,931	9	3,439	9	1,205	7	1,419	8	442	5	996	3
Doubtful results-----	6,274	9	1,103	2	1,203	2	507	1	341	2	1,193	1	116	1	191	1
Total positive and doubtful results-----	18,678	27	6,192	12	6,134	11	3,946	10	1,546	9	1,612	9	558	6	1,187	4
Percent infected with syphilis of total persons tested-----	15	-----	9	-----	9	-----	9	-----	5	-----	7	-----	5	-----	4	-----
Syphilis infections-----	10,549	100	4,628	100	4,630	100	3,232	100	876	100	1,172	100	451	100	1,030	100
Known to treatment-----	6,781	64	2,941	64	3,435	74	2,296	71	478	55	679	58	267	59	649	63
Not previously known to treatment-----	3,768	36	1,687	36	1,195	26	936	29	398	45	493	42	184	41	381	37
Primary-----	20	1	18	1	35	3	53	6	8	2	10	2	8	4	17	5
Secondary-----	51	1	67	4	52	4	118	12	31	8	51	10	21	11	23	6
Early latent-----	641	17	326	19	246	21	352	38	86	22	93	19	34	19	73	19
Other or unknown stages-----	3,056	81	1,276	76	862	72	413	44	273	68	339	69	121	66	268	70
Persons with unsatisfactory reports (not included in above figures)-----	899	-----	540	-----	150	-----	297	-----	64	-----	111	-----	30	-----	32	-----

<sup>1</sup> Bases for these percentages not shown.<sup>2</sup> Data not available.<sup>3</sup> Includes 27 cases with some previous treatment, but with infectious syphilis lesions at time of discovery.

NOTE: Blood-test results shown are based on the Mazzini test in Savannah; on the Kahn standard test in all other areas.



The results of the individual programs are shown in table 2, which gives the percentage of the total population tested in each community; the percentage tested in the age group of 15 to 50 years (where such figures were available); the results of the blood tests taken; and the number of syphilis infections found.

The results of the Savannah blood testing program showed the highest percentage of persons infected with syphilis in relation to the total number tested; the Columbus, Macon, and Augusta results were approximately the same; and the results for the other four areas were considerably lower. Previously unknown cases of syphilis discovered during the program periods represented from 26 to 55 percent of the total syphilis infections identified.

It should be noted that although in Columbus, Macon, and Augusta the results for each demonstration program showed that 9 percent of the total persons tested were infected with syphilis, the distribution of these infections varied widely as to the percentage of previously unknown cases discovered and the stages of infections.

The percentages of primary and secondary of new syphilis cases discovered are as follows: Savannah and Chatham County, 2 percent; Columbus and Muscogee County, 5 percent; Macon and Bibb County, 7 percent; Augusta and Richmond County, 18 percent; Moultrie and Colquitt County, 10 percent; Thomasville and Thomas County, 12 percent; Cairo and Grady County, 15 percent; Rome and Floyd County, 11 percent. It is seen that in the areas where intensive contact investigation was conducted (the last five),

this percentage was higher than in the other three areas.

In the Augusta figure of 2,296 persons known to treatment, there are included 27 persons with primary or secondary lesions who had had some previous treatment. The numbers of similar cases in the other areas are not available.

### Comments

1. The results of the eight Georgia mass blood-testing programs show that a large proportion of the population of a community will seek a blood test in response to an intensive publicity campaign, without the backing of a law.

2. Approximately 11 times as many previously unknown cases of early syphilis (including early latent) were discovered in the 45-day blood-testing program in Savannah as had been reported in the average 45-day period of the 12 months prior to this program. During the special program in Columbus 12 times, in Macon 10 times, and in Augusta 47 times as many previously unknown cases of early syphilis were discovered as ordinarily would have been reported during an equal period.

3. Intensive contact investigation conducted jointly with mass blood testing makes an exceptionally effective program, as is clearly shown by the results of the programs in Richmond, Colquitt, Thomas, Grady, and Floyd counties, where 25 percent of the cases of primary and secondary syphilis were discovered by contact investigation.

4. The Georgia Department of Public Health is continuing this type of special program in other areas of the State.

# The Incidence of Infection in Contacts of Early Syphilis

Arthur J. von Werssowetz, LL. B., M. D.<sup>1</sup>

The question of contact investigation as a means of finding new cases of venereal disease has been discussed thoroughly in many excellent articles. Its value and practicability have been established. There is no doubt that contact investigation is a direct method by which the sexual partners of a known infectious case of syphilis may be located at a time when their own infection may be in the incubation period—thus breaking the chain of infection.

The purpose of this study is to present the results achieved by the Chattanooga-Hamilton County Health Department in the investigation of contacts of patients with early syphilis. From a total of almost 10,000 contacts investigated during the period from 1941 through 1945, 3,383 contacts were chosen for study. These selected cases fell into two groups: (a) contacts of patients with primary and secondary syphilis, and (b) contacts of patients with early latent syphilis. Inasmuch as the diagnosis of early latent syphilis is an arbitrary one, we followed the accepted practice of classifying in this group those asymptomatic patients who had a definite history of onset of syphilis of less than 4 years or, in the absence of this criterion, those who were under 30 years of age. Of the 3,383 contacts, 1,250 were contacts of primary and secondary syphilis, and the remaining 2,133 were contacts of early latent syphilis.

<sup>1</sup> Director, Venereal Disease Control Program, Chattanooga-Hamilton County Health Department, Chattanooga, Tenn.

NOTE: This study was prepared with the statistical assistance of Mrs. William L. Harrell, of the Venereal Disease Control Program in Chattanooga, and Dr. Ruth R. Puffer, Director, Statistical Service, Tennessee State Department of Health.

During the period of the study, the case load of patients under treatment rose to a peak of almost 5,000, and the number of clinic visits increased to approximately 16,000 per month. The interviewing and field investigating staff was composed of four public health nurses trained in interviewing, and one field investigator. It is obvious that with such a work load the staff was unable to pick up every epidemiologic clue. Nevertheless, a praise worthy job was done by this group.

The 3,383 contacts were classified under three groups: (a) marital contacts on most of whom the information given was quite accurate; (b) extramarital contacts on whom the identification data were complete or sufficiently tangible to permit routine location; (c) the remainder of the extramarital contacts, or whom the information was either incomplete or totally unsatisfactory. In the last group, the investigating staff achieved excellent results, in spite of the poor quality of contact information.

The results of the study are presented in seven tables. Tables 1 to 3 show the findings on contacts of primary and secondary syphilis; tables 4 to 6 the findings on contacts of early latent syphilis, and table 7 summarizes over-all results. Most contacts of primary and secondary syphilis who were negative on initial examination were followed for approximately 3 months; and only after several negative serologic tests and negative physical examinations were they pronounced not infected. The procedure for contacts of early latent syphilitics was less exacting; such suspects were discharged as noninfected when they had had two negative serologic tests and two negative physical examinations, 1 month apart.

**Table 1.—Results of investigation of marital contacts of primary and secondary syphilis (complete information), 1941–45**

	Total		White male		White female		Negro male		Negro female	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
total contacts.....	148	100.0	31	100.0	28	100.0	38	100.0	51	100.0
1. Already under treatment.....	43	29.0	15	48.3	7	25.0	13	34.2	8	15.7
2. Brought to treatment.....	42	28.4	4	12.9	7	25.0	13	34.2	18	35.3
<i>a.</i> Primary and secondary.....	25	16.9	3	9.7	7	25.0	5	13.1	10	19.6
<i>b.</i> Early latent.....	10	6.8					2	5.3	8	15.7
<i>c.</i> Other stages.....	7	4.7	1	3.2			6	15.8		
3. Examined—not infected.....	46	31.1	6	19.4	13	46.4	6	15.8	21	41.2
4. Not examined or located.....	17	11.5	6	19.4	1	3.6	6	15.8	4	7.8
Percentage found not infected among examined contacts (items 2 and 3).....	52.3		60.0		65.0		31.6		53.8	

**Table 2.—Results of investigation of extramarital contacts of primary and secondary syphilis (complete information), 1941–45**

	Total		White male		White female		Negro male		Negro female	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
total contacts.....	602	100.0	84	100.0	90	100.0	210	100.0	218	100.0
1. Already under treatment.....	143	23.8	22	26.2	24	26.7	55	26.2	42	19.3
2. Brought to treatment.....	167	27.7	14	16.7	28	31.1	50	23.8	75	34.4
<i>a.</i> Primary and secondary.....	76	12.6	10	11.9	16	17.8	19	9.0	31	14.2
<i>b.</i> Early latent.....	69	11.5	3	3.6	12	13.3	20	9.5	34	15.6
<i>c.</i> Other stages.....	22	3.7	1	1.2			11	5.2	10	4.6
3. Examined—not infected.....	173	28.7	29	34.5	19	21.1	65	31.0	60	27.5
4. Not examined or located.....	119	19.8	19	22.6	19	21.1	40	19.0	41	18.8
Percentage found not infected among examined contacts (items 2 and 3).....	50.9		67.4		40.4		56.5		44.4	

**Table 3.—Results of investigation of extramarital contacts of primary and secondary syphilis (incomplete information), 1941–45**

	Total		White male		White female		Negro male		Negro female	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
total contacts.....	500	100.0	54	100.0	62	100.0	163	100.0	221	100.0
1. Already under treatment.....	85	17.0	5	9.3	8	12.9	27	16.6	45	20.4
2. Brought to treatment.....	109	21.8	1	1.9	15	24.2	26	15.9	67	30.3
<i>a.</i> Primary and secondary.....	41	8.2			8	12.9	9	5.5	24	10.9
<i>b.</i> Early latent.....	52	10.4	1	1.9	7	11.3	11	6.7	33	14.9
<i>c.</i> Other stages.....	16	3.2					6	3.7	10	4.5
3. Examined—not infected.....	119	23.8	18	33.3	11	17.7	46	28.2	44	19.9
4. Not examined or located.....	187	37.4	30	55.5	28	45.2	64	39.3	65	29.4
Percentage found not infected among examined contacts (items 2 and 3).....	52.2		94.7		42.3		63.9		39.6	



Table 1 shows the results of contact investigation of identifiable marital contacts of patients with primary and secondary syphilis. Of the total of 148 contacts in this group, 43 contacts or 29 percent were already under treatment. There were 42 cases of previously untreated syphilis discovered (28.4 percent of the group); and 25 of these cases were primary or secondary syphilis.

Table 2 shows the results of investigation with complete information on 602 extramarital contacts of primary and secondary syphilis patients. Of this number, 143 contacts or 23.8 percent were already under treatment when identified. A total of 167 cases of syphilis not previously known to treatment, or 27.7 percent, were found in the group. Of these 167 cases of previously untreated syphilis, 76 cases were in the primary or secondary stage.

Table 3 shows the results of investigation of the extramarital contacts of primary and secondary syphilis on whom information was incomplete. This group required, of course, the greatest investigative effort. Persons engaged in such work can comprehend this effort, and the amount of "shoe-leather epidemiology" it involves. Nevertheless, it is seen that of the 500 contacts in the group, 85 contacts or 17 percent were identified as already under treatment, and almost half of the group (228 contacts or 45.6 percent) were located and examined. Among those examined, 109 contacts (21.8 percent of the total group) were found to be infected and previously unknown to treatment; and 41 of these cases were primary or secondary syphilis. In this group of contacts on whom information was incomplete, only 187, or 37.4 percent, were not examined or located.

The accompanying tabulation summarizes data from the preceding three tables. It can be seen that in the total group of contacts of primary and secondary syphilis, a slightly higher percentage of white females was located than of white males, and also that a slightly higher percentage of Negro females than Negro males was located.

A higher percentage of infection was found among located female contacts than among located male contacts, and there was a slightly higher percentage of infection found among Negro female than among white females.

<i>Percentages among contacts of primary and secondary syphilis</i>		
Contacts located: <sup>1</sup>	White	Negro
Male-----	67.5	73.
Female-----	73.3	77.
Contacts infected <sup>2</sup> among contacts located:		
Male-----	53.5	61.
Female-----	67.4	68.

<sup>1</sup> Includes contacts already under treatment brought to treatment, and examined but found not infected.

<sup>2</sup> Includes contacts already under treatment and brought to treatment.

Table 4 deals with 468 marital contacts of patients with early latent syphilis; 9 of these contacts, or 19.9 percent, were found to be already under treatment. Previously untreated syphilis was diagnosed in 110 contacts (23.5 percent of the total group), but only 3 of these were primary or secondary syphilis cases.

Table 5 shows the results of investigation of 997 identifiable extramarital contacts of early latent syphilis. Of this number, 166 contacts or 16.6 percent were found to be already under treatment. Previously untreated syphilis was diagnosed in 241 contacts (24.2 percent of the total group). Primary and secondary syphilis was found in 24 of these contacts.

Table 6 shows the results of investigation with incomplete information of extramarital contacts of early latent syphilis. Because of the indefinite history of infection in the informant, and consequently many interim changes of address of contacts, possible changes of marital status and name, and other such factors, failure to locate contacts in this category is not unusual. However, of the total 668 contacts in this group, previously untreated cases of syphilis were

Table 4.—Results of investigation of marital contacts of early latent syphilis (complete information), 1941-45

	Total		White male		White female		Negro male		Negro female	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Total contacts.....	468	100.0	59	100.0	36	100.0	222	100.0	151	100.0
1. Already under treatment.....	93	19.9	12	20.3	10	27.8	46	20.7	25	16.5
2. Brought to treatment.....	110	23.5	14	23.8	4	11.1	44	19.8	48	31.8
a. Primary and secondary.....	3	.6	1	1.7	-----	-----	1	.5	1	.7
b. Early latent.....	71	15.2	7	11.9	4	11.1	23	10.4	37	24.5
c. Other stages.....	36	7.7	6	10.2	-----	-----	20	9.0	10	6.6
3. Examined—not infected.....	177	37.8	21	35.6	15	41.7	90	40.6	51	33.8
4. Not examined or located.....	88	18.8	12	20.3	7	19.4	42	18.9	27	17.9
Percentage found not infected among examined contacts (items 2 and 3).....	61.7		60.0		78.9		67.2		51.5	

Table 5.—Results of investigation of extramarital contacts of early latent syphilis (complete information), 1941-45

	Total		White male		White female		Negro male		Negro female	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Total contacts.....	997	100.0	78	100.0	43	100.0	476	100.0	400	100.0
1. Already under treatment.....	166	16.6	4	5.1	5	11.6	90	18.9	67	16.7
2. Brought to treatment.....	241	24.2	12	15.4	11	25.6	118	24.8	100	25.0
a. Primary and secondary.....	24	2.4	2	2.6	3	7.0	11	2.3	8	2.0
b. Early latent.....	141	14.1	7	9.0	5	11.6	59	12.4	70	17.5
c. Other stages.....	76	7.6	3	3.8	3	7.0	48	10.1	22	5.5
3. Examined—not infected.....	322	32.3	29	37.2	10	23.3	142	29.8	141	35.3
4. Not examined or located.....	268	26.9	33	42.3	17	39.5	126	26.5	92	23.0
Percentage found not infected among examined contacts (items 2 and 3).....	57.2		70.7		47.6		54.6		58.5	

Table 6.—Results of investigation of extramarital contacts of early latent syphilis (incomplete information), 1941-45

	Total		White male		White female		Negro male		Negro female	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Total contacts.....	668	100.0	31	100.0	40	100.0	294	100.0	303	100.0
1. Already under treatment.....	104	15.6	2	6.5	7	17.5	38	12.9	57	18.8
2. Brought to treatment.....	95	14.2	4	12.9	6	15.0	39	13.3	46	15.2
a. Primary and secondary.....	16	2.4	2	6.5	1	2.5	1	.3	12	4.0
b. Early latent.....	53	7.9	-----	-----	4	10.0	19	6.5	30	9.9
c. Other stages.....	26	3.9	2	6.5	1	2.5	19	6.5	4	1.3
3. Examined—not infected.....	156	23.3	7	22.6	9	22.5	67	22.8	73	24.1
4. Not examined or located.....	313	46.9	18	58.0	18	45.0	150	51.0	127	41.9
Percentage found not infected among examined contacts (items 2 and 3).....	62.2		63.6		60.0		63.2		61.3	

diagnosed in 95 contacts, or 14.2 percent—including 16 cases of primary or secondary syphilis. There were 313 contacts who were not examined or located, or 46.9 percent of the total group. Among the remaining 355 contacts who were identified, 104 were already under treatment and 156 were found to be non-infected.

### Over-All Analysis

In the group of contacts of primary and secondary syphilis, it is seen in table 7 that of the total of 1,250 such contacts, 271 (or 21.7 percent) were found to be already under treatment, and therefore did not represent previously untreated cases of syphilis found through investigative effort. Contact investigation succeeded in bringing in for examination 656 contacts, or 52.5 percent of the group. Of this number, 338 were found to be not infected with syphilis after an adequate observation and examination period. Thus, of the 656 contacts of primary and secondary syphilis examined because of contact investigation, 51.5 percent were found to be negative; and previously untreated syphilis was diagnosed in 318 of these contacts, or in 48.5 percent of the examined group. This last category breaks down as follows: Primary and secondary syphilis, 142 cases or 21.6 per-

cent of the examined group; early latent syphilis, 131 cases or 20 percent; other stages of syphilis, 45 cases or 6.9 percent.

In the early latent syphilis group, the total number of contacts investigated was 2,133. Of this number, 363 contacts or 17 percent were identified as already under treatment. Contact investigation brought in for examination 1,101 contacts or 51.6 percent of the group. Contacts found to be free of infection totaled 656 (59.5 percent of contacts examined). Contacts found to be infected with syphilis totaled 446, or 40.5 percent of those examined. There were only 43 cases of primary and secondary syphilis discovered, or 3.9 percent of the contacts examined; early latent syphilis was diagnosed in 265 contacts (24.1 percent); other types of syphilis in 138 cases (12.5 percent).

Due to many factors, several of which have been enumerated, the percentage of contacts not examined or located is greater in investigation among contacts of early latent syphilis than among contacts of primary and secondary syphilis. In our study there were 669 contacts of early latent syphilis not examined or located out of a total of 2,133 contacts, or 31.4 percent. Of 1,250 contacts of primary or secondary syphilis, 323 contacts, or 25.9 percent, were not examined or located.

**Table 7.—Over-all results of investigation of all contacts of early syphilis, 1941–4**

	Contacts of—			
	Primary and secondary syphilis		Early latent syphilis	
	Number	Percent	Number	Percent
Total contacts.....	1, 250	100. 0	2, 133	100. 0
1. Already under treatment.....	271	21. 7	363	17. 0
2. Brought to treatment.....	318	25. 4	446	20. 9
a. Primary and secondary.....	142	44. 7	43	9. 6
b. Early latent.....	131	41. 2	265	59. 5
c. Other stages.....	45	14. 1	138	31. 3
3. Examined—not infected.....	338	27. 0	655	30. 7
4. Not examined or located.....	323	25. 9	669	31. 4
Percentage found not infected among examined contacts (items 2 and 3).....	51. 5		59. 5	



## Discussion

The value of treating all contacts of patients with primary and secondary syphilis, irrespective of the presence or absence of infection in the contacts, has been discussed from time to time. The epidemiologic import of such a procedure appears to be somewhat radical in view of the high percentage of contacts found to be noninfected upon investigation. Such arbitrary treatment would be not only medically and epidemiologically unsound, but also rather costly.

This study has shown that a certain number of named contacts were known to have syphilis and were already under treatment for their infection at the time of investigation. Therefore, no investigative effort was necessary to locate them and they did not represent "new" cases of syphilis discovered through contact investigation.

Of the total number of contacts of primary and secondary syphilis who were located and brought to examination because of investigative effort, only 48.5 percent were found to be infected with syphilis. Thus, if all such contacts had been treated, much time and money would have been expended in treating the remaining 51.5 percent, which represented contacts who actually were not infected. In the identifiable marital group, this procedure could have resulted in the treatment of 2.3 percent of examined contacts found to be not infected.

It is a fundamental epidemiologic principle that each infected contact is potentially a new source of infection. If all contacts were to be treated immediately, before infection could be confirmed, how would this epidemiologic principle be followed logically? What about the con-

tacts of those treated but noninfected contacts? Would they also be treated? How could statistical analysis be of any value when dealing with original infection, relapse, or reinfection? Furthermore, it may well be illegal from a medicolegal point of view to treat a person for any disease in which diagnosis cannot be established with certainty.

## Summary

1. The results of contact investigation of 3,383 contacts of patients with primary, secondary, and early latent syphilis are analyzed, by race and sex of the contacts.

2. The analysis is presented in two main groups: contacts of primary and secondary syphilis, and contacts of early latent syphilis.

3. The epidemiologic information further subdivides these groups into identifiable marital and extramarital contacts, and extramarital contacts on whom information is incomplete.

4. In the group of contacts of primary and secondary syphilis, a slightly higher percentage of white females was located than of white males, and a slightly higher percentage of Negro females than of Negro males. A higher percentage of located female contacts was found to be infected than was true of located male contacts; and a slightly higher percentage of infection was found among Negro females than among white females.

5. A brief discussion on the subject of treating all contacts of primary and secondary syphilis is presented, which points out the percentage of contacts in this study who were not infected, and the implications of such a procedure.

# Local Prophylaxis in Experimental Syphilis of the Rabbit<sup>1</sup>

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The development of an effective, practical, prophylactic agent against gonorrhea and syphilis has been a continuing problem with the Venereal Disease Research Laboratory during 20 years.

Modern prophylaxis began in 1903 with the work of Metchnikoff and Roux (1), who demonstrated the efficacy of calomel ointment. As a result of their work, the use of 33-percent calomel ointment in lanolin and petrolatum was adopted as the basis of prophylaxis in many of the military organizations of the world. Later, the discovery of the susceptibility of the rabbit to infection by human strains of the syphilis organism led to a series of experiments with animals. Probably the most important experiment was that of Kolle and Evers (2). These workers purported to show that the syphilis spirochete could migrate from the abraded skin surface of the scrotum of the guinea pig to its regional lymphatic glands in as short a time as 5 minutes. Mahoney and Bryant (3) endeavored to demonstrate the length of time that the syphilis organisms remained on or near the mucosa. These studies also showed that the prophylactic value of mercury was due, to a large extent, to the systemic spirocheticidal action of mercury. A degree of protection was afforded by its application to an area of the skin remote from the site of exposure. In a very recent publication Eagle et al. (4) re-

ported the prophylactic effectiveness of phenylarsenoxide in ointments and in soap.

For the purposes of this study, a hypercritical evaluation of the general characteristics of widely used prophylactics was set down in order that the search for agents might be directed toward overcoming or bypassing those qualities which were undermining the preventive efforts.

The commonly used prophylactics were messy or untidy, and frequently resulted in stains or other damage to clothing; their application was complicated and time-consuming, which rendered them impractical for use within the time limit of their effectiveness; they often produced physical discomfort, at times amounting to severe pain; some agents were unstable, therefore unreliable; the protective adequacy of the ingredients was frequently questioned; and, finally, the properties described above resulted in a general hesitancy to obtain or use the prophylactics.

During the long search for an agent possessing none or few of the undesirable characteristics, a very large number of substances have been investigated. The prophylactic properties of mapharse alone, and in combination with alkyl aryl sulfate, are presented in this paper.

## Methods

The exposure and prophylaxis used in the experiment simulated the local physical conditions for human exposure to infection, followed by a practical prophylaxis.

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ctic procedure. In the experimental study, the genital mucosal surfaces of male rabbits were exposed to the virulent *Spirochaeta pallida* by local contact. A suspension of *S. pallida* was prepared by inducing an acute testicular syphiloma in 50-percent rabbit serum broth. Dilutions were made so that the darkfield preparation contained an average of three actively motile spirochetes per oil-immersion field. The tissue particles were not separated from the fluid medium, so that at the termination of the experiment the number of spirochetes in the fluid was increased definitely.

Normal male rabbits with well-developed genitalia were restrained on suitable boards. The genitalia were cleaned with cotton sponges moistened with normal saline. Tiny pledgets of absorbent cotton (2 x 9 mm.) were soaked in the suspension of spirochetes, then inserted in the preputial sac alongside the penis. The prepuce was maintained closed by clamping the surrounding fur with a small hemostat. The pledgets were remoistened every 15 minutes by putting a drop of the suspension in the preputial pocket. The contact exposure was continued for one or two hours. After removal of the cotton, the mucous membrane was examined for macroscopic evidence of trauma which, if found, eliminated the animal from the experiment.

The five control animals for each experiment were returned to their respective cages without treatment, and all developed darkfield-positive lesions of syphilis. The remaining exposed animals were given prophylactic treatment by local application of the medicament under investigation. The prepuce was retracted; the genitalia and surrounding area which may have been contaminated were thoroughly moistened with the prophylactic solution and massaged for 1 minute. In the process, the penis was inserted in a 25-cc. Erlenmeyer flask containing the solution. By pressing the opening of the flask against the body, a temporary erection was produced so that the solution could reach the entire surface.

## Discussion

The prophylactic application should be a simple procedure. It is desirable to include and to complete the prophylaxis in a cleansing process which may be completed in a few minutes. This would encourage immediate prophylaxis as well as prophylaxis after each one of multiple exposures. Local application in the male should be easily and quickly accomplished. For the female, the preparation should be suitable for use in a douche.

For years it has been realized that maximum effectiveness of chemical prophylaxis has not been obtained. The proper use of a prophylactic kit containing soap, a tube of calomel ointment, and a tube of a suitable silver preparation may have been effective in preventing syphilis and gonorrhea. The single-tube prophylactic may or may not have contained the reagents which would have prevented these diseases. However, these prophylactics were rarely used properly, and frequently were not used at all. The characteristics of the older prophylactics made it desirable to produce another, more acceptable and more effective. Ideal preparations should be spirocheticidal, bacteriocidal, and virucidal; cleansing, deodorizing, and penetrating; nontoxic to skin and mucous membranes; colorless and odorless; capable of being prepared inexpensively in a small unit; and capable of being easily and quickly used.

The spirocheticidal, bacteriocidal, and virucidal properties are readily demonstrated in vitro; but only the spirocheticidal effect can be evaluated in animal studies.

The metallic compounds were surveyed to determine their in vivo and in vitro spirocheticidal properties. Because of their toxic effect on the animal, some compounds, e. g., phenyl mercuric salts, were promptly discarded. Others, e. g., cadmium salts, were discarded when their toxicity to the human being was ascertained. The most adaptable compounds were the arsenicals. Mapharsen,



Table 1

Number of animals exposed	Duration of exposure (hours)	Concentration of mapharsen (percent)	Number of animals infected	Number of animals protected
15-----	1	0.025	5	10
7-----	1	.1	0	
5-----	2	.1	0	

being nontoxic and stable in dry form, was selected for investigation.

As shown in table 1, local application of mapharsen in aqueous solution was effective in preventing infection of rabbits exposed to virulent *S. pallida*. The 0.025-percent concentration of mapharsen was not adequate for prophylactic purposes; the 0.1-percent concentration offered protection after a 2-hour exposure in rabbits.

The spirocheticidal powers of 0.1-percent mapharsen demonstrated only one necessary property for an effective prophylactic. Lacking were the cleansing properties and the psychological effect of soap. But soap was not satisfactory either alone or as a coagent with mapharsen because its use resulted in a bulky prophylactic packet and because it was not quickly soluble. The mixture of soap and mapharsen gives a suspension instead of the necessary solution.

The increase in the number of detergents for which nonirritating, nontoxic properties were claimed prompted an investigation of them as active prophylactic agents or, at least, as vehicles for the active spirocheticidal substance. Their surface activity permits penetration of mucous film; their detergent property cleanses and, at the same time, produces

the familiar "suds"; and they deodorize without residual evidence of having been used. All these qualities made them an ideal field for study.

In general it was found that detergents did not have enough antispirechetic activity to be used alone. The search was directed toward the discovery of a detergent capable of being combined with mapharsen. Since mapharsen's stability could be maintained for long periods only in the dry state, the packaging of mapharsen with a detergent would be difficult particularly if the accompanying compound should contain water or should be hygroscopic. Alkyl aryl sulfate was found to be suitable for combination with mapharsen.

Mixtures of aqueous solutions of alkyl aryl sulfate and mapharsen were studied using two exposure intervals. The results are given in table 2.

Alkyl aryl sulfate was lethal to organisms in vitro, but its spirocheticidal properties in vivo were not adequate for syphilis prophylaxis. It possessed other qualities which were valuable: its detergent action would aid in cleaning and deodorizing; its surface tension would aid in the penetration of the medicament into the folds of the mucous membrane and the urethral meatus.

Table 2

Number of animals exposed	Duration of exposure (hours)	Concentration of mapharsen (percent)	Concentration of alkyl aryl sulfate (percent)	Number of animals infected	Number of animals protected
23-----	1	0.1	1.0	2	
29-----	1	.2	1.0	0	
7-----	1	.2	2.0	0	
35-----	2	.2	1.0	1	

These properties of alkyl aryl sulfate, coupled with the spirocheticidal power of mapharsen, were the same as many of the desirable properties of the ideal prophylactic. The results depicted in table 2 indicate that 0.2-percent solution of mapharsen with alkyl aryl sulfate is more effective than the 0.1-percent mapharsen combination and that the mixture is effective in preventing infection of rabbits following a 2-hour exposure to *T. pallida*.

### Conclusion

Mapharsen (0.2-percent) in a 1.0-percent aqueous solution of alkyl aryl sulfate protected rabbits from infection with *T. pallida*.

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## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of all articles concerned with venereal diseases or related subjects which have been published in the better known journals both here and abroad during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

AM. J. SYPH., GONOR. & VEN. DIS., ST. LOUIS

\*The minimal infectious inoculum of *Spirochaeta pallida* (Nichols strain), and a consideration of its rate of multiplication in vivo. Harold J. Magnuson, Harry Eagle and Ralph Fleischman. 32: 1-18, Jan. 1948.

\*The effect of antisyphilitic treatment on the microscopic appearance of syphilitic aortitis. Bruce Webster and George G. Reader. 32: 19-27, Jan. 1948.

The minimal infectious inoculum of *Spirochaeta pallida* (Nichols strain), and a consideration of its rate of multiplication in vivo. Harold J. Magnuson, Harry Eagle and Ralph Fleischman. Am. J. Syph., Gonorr. & Ven. Dis., 32: 1-18, 1948.

The authors review previously reported data and present their own findings on the minimal infective inoculum of *Spirochaeta pallida* and the effect of the

size of the inoculum on the incubation period in experimental rabbit syphilis.

The work reported was begun at the Laboratory of Experimental Therapeutics of the United States Public Health Service and the Johns Hopkins University and was continued at the Reynolds Research Laboratory at the University of North Carolina, the same methods being used at both laboratories.

Emulsions were prepared from the testes of syphilitic rabbits, the spirochetes were counted by an adaptation of the method of Morgan and Vryonis, and the inoculation of rabbits under study was completed within 1 hour, at the end of which time all the spirochetes in the original emulsion were still actively motile. Animals were inoculated intracutaneously over the back at one to six sites, and intratesticularly in one testis. All inoculated sites were examined twice weekly for at least 90 days; only lesions in which *S. pallida* was demonstrated by darkfield examination were considered positive. In animals which developed no lesions, popliteal lymph node transfers to another rabbit were carried out 3 to 6 months after the original inoculation to detect asymptomatic infection, which proved to be rare.

The results of intracutaneous inoculation showed that results in animals inoculated at a single site were almost identical with those inoculated at multiple sites. An inoculum of 200,000 organisms was regularly infectious with a mean incubation period of 14.3 days. A decrease in the size of the inoculum produced a progressive increase in the incubation period and an increasing percentage of inoculation failures. Of the sites inoculated with 20,000 organisms, 92 percent were positive; with 2,000, 200, 20, and 2 organisms, the percentage of successful inoculations fell from 93 to 88, 71, and 47 percent, respectively. With each tenfold decrease in the size of the inoculum, there was a progressive increase in the mean incubation period; periods of 17, 27, 27, 32, 35, and 36 days characterized inoculations of 20,000, 2,000, 200, 20, 2, and 1 spirochetes, respectively.

The results of intratesticular inoculation showed the minimal infectious inoculum to be 1 spirochete; 1 to 2 spirochetes were regularly infectious. With this method, the incubation period was approximately the same whether 1, 10, 100, or 1,000 organisms were injected, the averages varying between 35 and 41 days but further increase in the inoculum brought a sharply decreased incubation period of 27 days with 10,000 spirochetes and 17 days with an inoculum of 200,000 organisms.

The authors point out that if so few organisms suffice to produce an infection in rabbits, it is necessary that the size of the inoculum be rigidly controlled in experimental studies on the chemoprophylaxis, abortion, or treatment of syphilitic infection.

From data from the skin inoculation experiments, the authors estimate that the average rate of multiplication of the spirochetes in vivo was 30 hours for each division of one spirochete into two spirochetes.

**The effect of antisyphilitic treatment on the microscopic appearance of syphilitic aortitis.** Bruce Webster and George G. Reader. *Am. J. Syph., Gonorr. & Ven. Dis.*, 32: 19-27, 1948.

In order to determine the effect of treatment on the microscopic picture of syphilitic aortitis, the authors studied microscopic sections of the aortas of 45 patients with evidence of syphilitic aortitis at post mortem.

The state of inflammation was recorded on a rating scale set up according to the intensity of the perivascular infiltration, endarteritis, lymphocytic infiltration, and the presence of plasma cells. The patients were divided into 3 groups: 19 patients who had received adequate treatment, which was considered to be approximately 20 arsenical and 20 bismuth injections; 7 who had been inadequately treated; and 19 who had received no treatment.

It was found that only three of the adequately treated patients showed active inflammation, whereas all the un-



ated patients showed an active syphilitic process, one presenting marked endarteritis and a microscopic gumma. Five of the seven who had received inadequate treatment showed activity of the syphilitic inflammatory process. For those whose duration of infection was known, no correlation could be seen between duration of infection and activity of the arteritis.

Although many more cases must be observed before a definite conclusion can be reached, data from this study indicate to the authors that adequate specific therapy for syphilitic aortitis with arsenic and bisumuth can be expected to modify profoundly the inflammatory process as determined by microscopic examination of the aorta.

#### ARCH. DERMAT. & SYPH., CHICAGO

\*Relation between thiamine and arsenical toxicity. Preliminary report. George B. Sexton and Charles W. Gowdey. 56: 634-647, Nov. 1947.

Pseudoepitheliomatous hyperplasia due to granuloma inguinale. O. S. Philpott. 56: 669-675, Nov. 1947.

\*Dermatitis venenata due to streptomycin. Orlando Canizares and Harry Shatin. 56: 676-677, Nov. 1947.

\*Suppression of treponemicidal action of arsenic with 2,3-dimercaptopropanol (BAL). Report of clinical observations in five cases. Gerard A. De Oreo. 56: 695-698, Nov. 1947.

\*Observations on spinal fluid in lymphogranuloma venereum. William Leifer. 56: 699-705, Nov. 1947.

Ninth day erythema showing photosensitivity. [Including syphilis.] Chaim Berlin. 56: 771-774, Dec. 1947.

Cutaneous testing in a case of exfoliative dermatitis caused by penicillin. Joseph Farrington and Joseph Tamura. 56: 807-811, Dec. 1947.

Sulfonamide sensitivity and prophylaxis against venereal disease. Robert A. Burger. Clinical Notes. 56: 869-871, Dec. 1947.

**Relation between thiamine and arsenical toxicity. Preliminary report.** George B. Sexton and Charles W. Gowdey. Arch. Dermat. & Syph., 56: 634-647, 1947.

The authors review the literature and present a preliminary report on the relationship between thiamine and arsenical toxicity.

A study was made of patients undergoing intensive arsenical (5-day drip) therapy for early syphilis, in order to determine: (1) Whether the patient was primarily deficient in vitamin B<sub>1</sub> or was rendered deficient by arsenical administration; and (2) the curative value of thiamine in reducing the cerebral complications due to arsenicals. The method used to estimate the level of vitamin B<sub>1</sub> in the patients studied is described in detail. Thirteen cases were studied in which intensive 5-day drip arsenical therapy was given. Three case reports are presented on patients in whom acute arsenical intoxication developed, one of which terminated fatally. The authors' study revealed that nine patients, none of whom had vitamin B<sub>1</sub> deficiency, showed a decided disturbance in carbohydrate metabolism during the intensive arsenical therapy, as evinced by increased pyruvic acid and sugar in the blood.

Experiments were also carried out with dogs to determine whether a normal dog would show evidence of vitamin B<sub>1</sub> deficiency when given the 5-day oxophenarsine hydrochloride drip. The experimental procedure is described in detail. Toxic reactions occurring in two dogs, with fatal results in one, are discussed. The results obtained in these experiments parallel the clinical studies, namely, a significant derangement in carbohydrate metabolism as manifested by increased pyruvic acid and sugar in the blood during the course of the drip. The greater the clinical toxicity, the greater was the disturbance of carbohydrate metabolism.

The authors are of the opinion that BAL and vitamin B<sub>1</sub>, in sufficient dosage, should be complementary in the treatment of arsenical encephalopathy. When the usefulness of vitamin B<sub>1</sub> has been exceeded, BAL may be used to inactivate the arsenical, although this means loss of its spirocheticidal effect. In a reaction seriously involving the central nervous system, if vitamin B<sub>1</sub> and BAL are used therapeutically, they must be given early before the reaction has gone beyond the irreversible pathologic lesion. Intensive

arsenotherapy is contraindicated when an initial pretreatment high level of pyruvic acid accompanied by clinical signs of acute B<sub>1</sub> avitaminosis exist.

**Dermatitis venenata due to streptomycin.** Orlando Canizares and Harry Shatin. Arch. Dermat. & Syph., 56: 676-677, 1947.

The authors review the various toxic reactions to streptomycin which have been reported and present a case report of a nurse in whom dermatitis venenata involving the hands, forearms, and face developed after handling streptomycin solutions.

The nurse, a white woman aged 32, first complained of itching, swelling, and redness of the eyelids and sides of the neck. A diagnosis of contact dermatitis was made and the patient was given pyribenzamine hydrochloride and a soothing lotion, which did not affect the disease. The lesions subsided rapidly after she stopped working but again developed after she returned to work. Similar patches appeared on the hands, fingers, and forearms.

The history and clinical findings are reported in detail. Patch tests with various cosmetics and penicillin were negative, but tests with a solution of streptomycin diluted 1 to 10 in distilled water were positive. One hour after application, the streptomycin produced local pruritis, and 48 hours later, it elicited an erythematovesicular reaction. A definite flare-up of the lesions on the face and hands also occurred.

The patient stopped handling streptomycin, and the lesions and pruritis began to subside. Later, she worked 1 day and wore rubber gloves while handling the drug. There was no exacerbation of the disease. A subsequent patch test and an intradermal test with streptomycin diluted 1 to 100 yielded positive results.

The authors state that dermatitis venenata has occurred in two additional nurses who have handled the drug for a period of 5 months. Many nurses came in contact with the drug for short periods, without dermatitis developing.

Further studies on cutaneous sensitivity to streptomycin are in progress, it is stated.

**Suppression of treponemicidal action of arsenic with 2,3-dimercaptopropionate (BAL). Report of clinical observations in five cases.** Gerard A. De Ore. Arch. Dermat. & Syph., 56: 695-698, 1947.

The author reports on a study which was conducted in order to evaluate the suppressive action of BAL on the treponemicidal fraction of a trivalent arsenic. Five patients with acute early syphilis were treated with BAL and oxophenarsine hydrochloride concomitantly. Clinical reports for each patient are presented in detail.

In one case, *Treponema pallidum* persisted for 8 days by the use of BAL; in two cases, organisms were still present after 3½ days; and in one instance, *pallidum* disappeared rapidly following the withholding of one injection of BAL. In the other case, BAL administered intramuscularly appeared to have no suppressing effect on the arsenic, which was given intravenously, thus allowing for more rapid dissemination.

In all cases when *T. pallidum* could no longer be seen, arsenic and BAL injections were discontinued, and crystalline penicillin administered every 3 hours for a total of 4,000,000 units was substituted.

It was observed that when penicillin was given, each patient experienced a febrile Herxheimer reaction equal to or greater than the initial one seen after the first injection of arsenic, which prompts the author to assume that motile viable spirochetes were still present at the time penicillin therapy was started.

From his observations, the author concludes that adequate doses of BAL have a suppressing effect on the treponemicidal action of arsenic.

**Observations on spinal fluid in lymphogranuloma venereum.** William Leifer. Arch. Dermat. & Syph., 56: 699-705, 1947.

The author makes an extensive review of the literature and presents results of examinations of the spinal fluid of 1

en with acute lymphogranuloma venereum.

The duration of the lymphadenitis varied from 3 to 28 days. Except for headache, there were no symptoms suggesting involvement of the central nervous system. Eighteen patients had no clinical evidence or history of syphilis; had syphilis or a history of the disease. The examination of spinal fluid included Wassermann test with 0.5 and 1.0 cc. of fluid, a cell count, a Pandy test, and a colloidal gold test. In 22 cases an estimation of total protein of the spinal fluid was made, while in 11 cases the chloride value, and in 13, the sugar content were determined.

The observations of the spinal fluid in the 25 cases are reported in detail in a table. Only one significantly abnormal spinal fluid was seen and this was attributed to concomitant asymptomatic neurosyphilis. In the remaining 24 cases, the Wassermann reaction of the spinal fluid was negative, and the cell count and reaction to the Pandy test were normal. The total protein was moderately decreased in two additional patients. The level of chloride was normal in 5 of the 6 patients examined and somewhat reduced in the other 6. The determinations of sugar and the colloidal gold curves were within the limits of normal, except in the patient with neurosyphilis. The author states that these observations of moderately abnormal values for protein and chloride of the spinal fluid do not provide sufficient evidence for the assumption of invasion of the central nervous system by the virus of lymphogranuloma venereum.

No biologic false positive Wassermann reactions were observed in the spinal fluid of the 25 patients, despite the rather high reported incidence of their occurrence in acute lymphogranuloma venereum.

In conclusion, the author discusses the similarity between lymphogranuloma meningoenzephalitis and syphilitic meningitis. The Wassermann reaction has been consistently negative in all recorded cases of lymphogranuloma meningoen-

zephalitis and serves as a valuable aid to diagnosis when facilities for virus studies are not available.

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\*Syphilitic primary optic atrophy. A review of 54 cases. Sidney Levin, Laurence D. Trevett and Milton Greenblatt. 237: 769-772, Nov. 20, 1947.

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**Syphilitic primary optic atrophy.** A review of 54 cases. Sidney Levin, Laurence D. Trevett and Milton Greenblatt. New England J. Med., 237: 769-772, 1947.

The authors report on a series of 54 patients (51 male and 3 female) with syphilitic optic atrophy admitted to the Boston Psychopathic Hospital from 1921 to 1944.

In 34 of these patients (63 percent), the first manifestation of neurosyphilis was gradual loss of vision. Data on serologic findings and pupillary abnormalities are presented. The diagnoses on admission indicated more cases with a tabetic element than with a parietic element, although it was observed that the tabetic features were essentially mild. In 19 cases there was a parietic element and in 25 there was a tabetic element.

Of 43 patients who were not totally blind when treatment was begun, 27 were followed for 2 years or longer, the average duration of follow-up study being 7 years. Of 11 patients treated with chemotherapy only, 6 (55 percent) were blind on follow-up study of 2 years or longer. Of 16 patients treated with fever therapy in addition to chemotherapy, only 2 (13 percent) were blind on follow-up examination 2 years or more after treatment. These results, which are reported in detail, indicate that fever therapy was superior to chemotherapy in these cases.

The cerebrospinal fluid findings were

classified according to severity as group I, II, or III (the last being the strongest and equivalent to the so-called "parietic formula"). These are reported in detail. They indicate that syphilitic primary optic atrophy is generally accompanied by strongly positive cerebrospinal fluid findings unless antisyphilitic treatment has been started.

The authors report on a further study which was made of the cerebrospinal fluid in 11 cases in which, as a result of treatment, syphilitic primary optic atrophy had become definitely arrested for a period of from 2 to 15 years. Data on this study indicate that, in general, optic atrophy becomes arrested before the cerebrospinal fluid becomes normal and that when the optic atrophy is arrested, the cerebrospinal fluid findings usually fall in group I or II.

In conclusion, the authors state that syphilitic primary optic atrophy may respond well to fever therapy, provided the treatment is begun before useful vision is lost.

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## CURRENT NOTES AND REPORTS

### New Supplement Available

A monograph by Dr. Paul D. Rosahn, *Clinical Studies in Syphilis*, has recently been published and is now ready for distribution. This is a collection of earlier reports published in various journals under the general title of "Studies in Syphilis." The several reports were integrated, with modifications and addenda, and are now presented as a complete study, in Supplement No. 21 to the JOURNAL OF VENEREAL DISEASE INFORMATION.

This important study was conducted

from 1940 through 1946 by Dr. Rosahn and Dr. Bernard Black-Schaffer at the Yale University School of Medicine and the laboratories of the New Britain General Hospital, aided by a grant from the Venereal Disease Division of the United States Public Health Service.

Copies may be obtained through the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. The price is 25 cents a copy, or \$18.75 a hundred copies.

### Health and Human Relations Course

The University of Pennsylvania, through its School of Education and Institute for the Study of Venereal Disease, announces the sixth annual course in Health and Human Relations, to be held from June 28 to July 30, 1948, inclusive. Registration dates are June 25 and June 28.

The course is designed to interest key persons and to prepare them for organizational responsibility and vision. It is maintained at an advanced level in a seminar, conference, and round-table atmosphere. The course carries five se-

mester credits in the School of Education. It can be taken for either graduate or undergraduate credit, or it can be taken without credit.

Applications for admission should be addressed to Dr. John H. Stokes, Director, Institute for the Study of Venereal Disease, Hospital of the University of Pennsylvania, Philadelphia 4, Pa. Requirements for admission include adequate general educational preparation and specific recommendation by a suitable agency or authority in the applicant's present or intended field of activity.

## Information on Premarital Laws

The Pennsylvania Department of Health has prepared an up-to-date tabulation of the laws and regulations in regard to the premarital serologic test for syphilis in each of the 48 States. There are 38 States which appear to have adequate laws at this time. The tabulation provides information on the location of State

laboratories, reciprocity between State waiting period required, type of test required, procedure for obtaining tests, and other pertinent information. The data appears in the January 1948 issue of *Pennsylvania's Health*, published in Harrisburg by the Pennsylvania Department of Health.

## An Old Landmark Goes

A nostalgic note in the national venereal disease control program is encountered with the recent announcement of the discontinuance of the USPHS-VD clinic in the old Free Bath House of the National Park Service, Hot Springs National Park, Ark. One of the oldest venereal disease clinics in the country, the

Bath House will be remembered by many staff members in the Division who received early clinical experience there.

Venereal disease diagnostic activities have been transferred to the Garland County-Hot Springs City Health Department.

## A Report and Chart on Penicillin Treatment

A report on "The Status of Penicillin in the Treatment of Syphilis," issued December 1, 1947, by the Syphilis Study Section, National Institute of Health, United States Public Health Service, to the Council on Pharmacy and Chemistry of the American Medical Association, was published in the March 27, 1948 issue of the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*.

The report was prepared for the purpose of summarizing for the practicing physician the principal facts of clinical importance with regard to penicillin in syphilis, including treatment of the various stages of syphilis, schedules as

presently advised, and posttreatment observation.

A chart, based on this report, has been prepared in the Venereal Disease Division. The chart is entitled "Examples of Acceptable Penicillin Schedules," and is now ready for distribution. It will also appear in the June 1948 issue of the *JOURNAL OF VENEREAL DISEASE INFORMATION*.

Reprints of the report and copies of the chart may be obtained through the Venereal Disease Division. Both will be distributed at the 1948 session of the American Medical Association and the American Venereal Disease Association to be held in Chicago on June 20 and 21.



equal on publicity in intensive case-finding projects; and a concise, printable outline of intensive case-finding procedures.

The transcriptions have already received widespread advance publicity in the radio trade journals. For the past 2 months, requests for permission to broadcast the programs have been coming in from radio station managers throughout the country. At a February meeting in New York City, radio station managers from the Atlantic seaboard and eastern Central States offered suggestions for proper planning and utilization of the transcriptions. The managers were enthusiastic in their approval of the plan and pledged their support in providing suitable air time to State and local health departments wishing to use the transcriptions in connection with case-finding activities.

Production of the master records will be completed in May, and duplicates will then be made for release this summer.

Present plans call for one or more pilot demonstrations during the summer. The radio programs will be utilized, and the Bureau of Applied Social Research, Columbia University, will evaluate their effectiveness in connection with all other public appeal mediums used. General release of the programs will then follow through Public Health Service district offices, to States and communities planning intensive case-finding demonstration projects in the autumn, winter, and spring.

No decisions have yet been made as to where the pilot demonstrations are to be held. The Washington office of the Venereal Disease Division will welcome applications from States or localities for Federal assistance, on a project basis, in conducting the pilot studies.

# STATISTICS

## Cases of Syphilis and Gonorrhea Reported to the United States Public Health Service by State and Territorial Health Departments, First and Second Quarters Fiscal 1948

[Known military cases excluded]

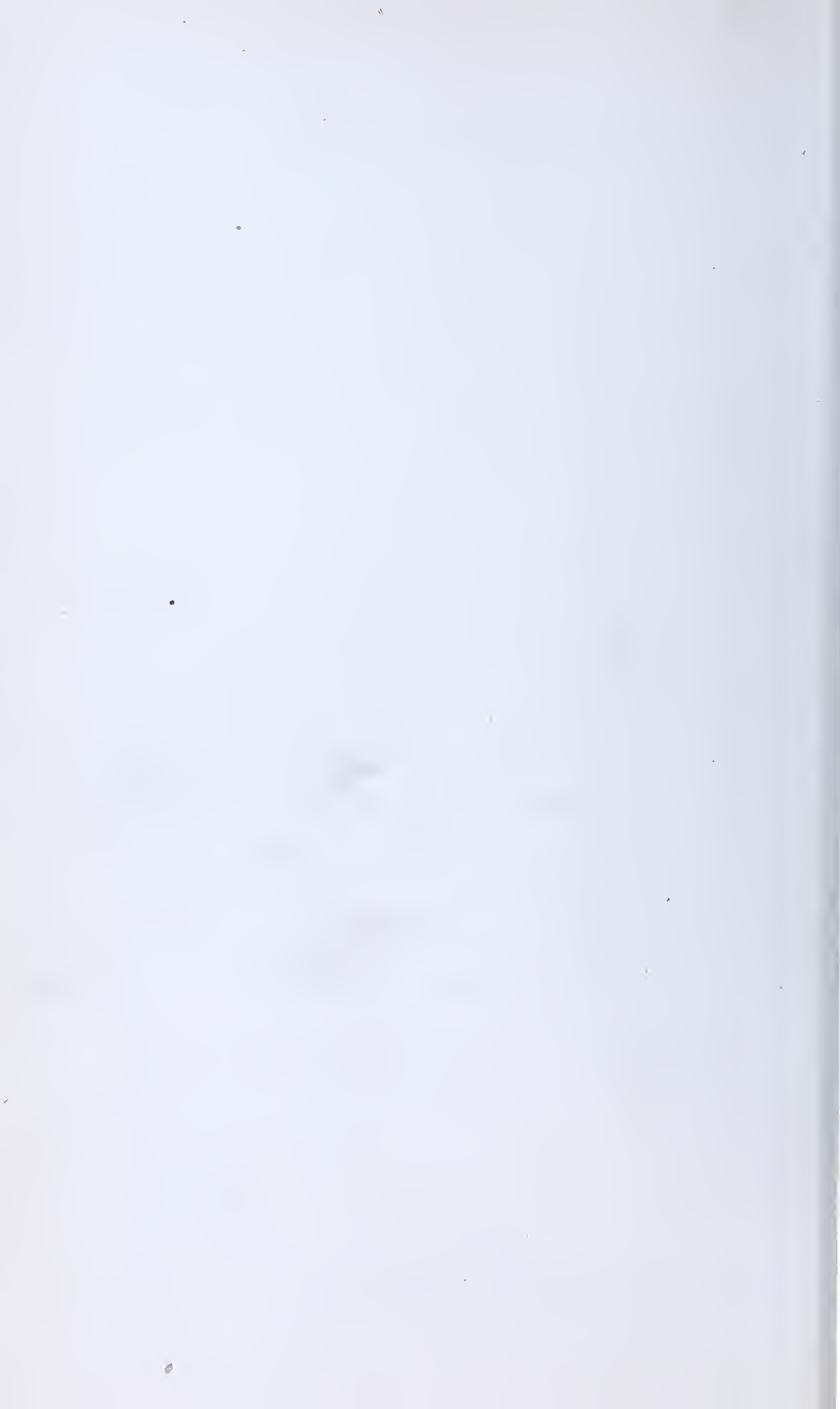
Area	Syphilis						Gonorrhea								
	Primary-secondary			Early latent			Late and late latent			Congenital			Not stated		
	July-Sep-tember	Oeto-ber-De-cember	Trend ratio	July-Sep-tember	Oeto-ber-De-cember	Trend ratio	July-Sep-tember	Oeto-ber-De-cember	Trend ratio	July-Sep-tember	Oeto-ber-De-cember	Trend ratio	July-Sep-tember	Oeto-ber-De-cember	Trend ratio
District 1—Total	3,260	3,354	1.03	4,345	4,146	.95	7,241	7,370	1.02	475	457	.96	319	366	1.15
Connecticut	66	69	1.05	70	94	1.34	130	148	1.14	12	11	(a)	47	53	1.13
Delaware	74	66	.89	67	81	1.21	42	42	1.00	3	8	(a)	43	54	1.26
Maine	114	133	1.17	27	27	1.17	47	83	1.77	6	12	(a)	1	9	(a)
Massachusetts	161	218	1.35	77	118	1.53	307	417	1.36	44	49	1.11	0	0	(a)
New Hampshire	16	15	(a)	15	4	(a)	48	35	.73	8	9	(a)	1	1	(a)
New Jersey	373	370	.99	863	655	.76	993	833	.84	37	37	.77	15	17	(a)
New York	1,467	1,460	1.00	1,865	1,689	.91	4,455	4,579	1.03	174	197	1.13	106	75	.71
New York City	1,170	1,158	.99	1,691	1,529	.90	3,407	3,431	1.01	130	138	1.06	16	22	(a)
Pennsylvania	1,930	1,983	1.06	1,338	1,447	1.08	1,076	1,137	1.06	163	124	.76	60	74	1.23
Philadelphia	517	435	.84	991	965	.97	672	685	1.02	39	44	1.13	74	123	1.66
Pittsburgh	185	174	.94	139	95	.68	184	148	.80	34	18	.53	0	0	(a)
Rhode Island	35	21	.60	22	23	1.05	133	83	.62	10	8	(a)	23	36	1.57
Vermont	24	19	.78	5	8	(a)	10	13	(a)	7	2	(a)	23	47	2.04
District 2—Total	4,311	3,655	.85	3,775	3,583	.95	2,569	2,663	1.04	428	410	.96	173	204	1.18
District of Columbia	334	400	1.20	339	356	1.05	317	320	1.01	37	47	1.27	6	14	(a)
Maryland	627	492	.78	473	446	.94	503	605	1.20	62	52	.84	134	119	.89
Baltimore	441	362	.82	366	332	.91	388	513	1.32	37	29	.78	29	34	1.17
North Carolina	994	821	.83	731	806	1.10	253	295	1.17	101	89	.88	0	0	(a)
South Carolina	904	592	.65	914	635	.69	374	345	.92	67	55	.82	0	0	(a)
Virginia	847	803	.95	924	985	1.07	600	696	1.16	96	110	1.15	33	71	2.15
West Virginia	605	547	.90	394	355	.90	522	402	.77	65	57	.88	0	0	(a)
District 3—Total	4,003	4,052	1.01	4,637	4,647	1.00	6,375	6,102	.96	557	602	1.08	573	629	1.10
Illinois	1,174	1,166	.99	1,305	1,407	1.08	1,877	2,021	1.08	136	149	1.10	0	0	(a)
Chicago	790	714	.90	965	1,034	1.07	1,176	1,231	1.03	91	88	.97	0	0	(a)
Indiana	475	421	.89	385	255	.66	644	399	.62	65	40	.62	0	0	(a)
Kentucky	603	489	.81	387	435	1.12	503	481	.96	52	56	1.08	162	141	.87
Michigan	778	739	.95	961	892	.93	1,473	1,385	.94	118	127	1.08	407	483	1.19
Ohio	885	1,167	1.32	1,446	1,537	1.06	1,587	1,594	1.00	156	212	1.36	0	0	(a)
Wisconsin	88	70	.80	153	121	.79	291	222	.76	30	18	.60	4	5	(a)
District 4—Total	5,319	5,471	.97	6,050	6,096	.99	8,607	8,366	.96	602	618	1.02	573	629	1.10
District of Columbia	334	400	1.20	339	356	1.05	317	320	1.01	37	47	1.27	6	14	(a)
Maryland	627	492	.78	473	446	.94	503	620	1.20	62	52	.84	134	119	.89
Baltimore	441	362	.82	366	332	.91	388	513	1.32	37	29	.78	29	34	1.17
North Carolina	994	821	.83	731	806	1.10	253	295	1.17	101	89	.88	0	0	(a)
South Carolina	904	592	.65	914	635	.69	374	345	.92	67	55	.82	0	0	(a)
Virginia	847	803	.95	924	985	1.07	600	696	1.16	96	110	1.15	33	71	2.15
West Virginia	605	547	.90	394	355	.90	522	402	.77	65	57	.88	0	0	(a)
District 3—Total	4,003	4,052	1.01	4,637	4,647	1.00	6,375	6,102	.96	557	602	1.08	573	629	1.10
Illinois	1,174	1,166	.99	1,305	1,407	1.08	1,877	2,021	1.08	136	149	1.10	0	0	(a)
Chicago	790	714	.90	965	1,034	1.07	1,176	1,231	1.03	91	88	.97	0	0	(a)
Indiana	475	421	.89	385	255	.66	644	399	.62	65	40	.62	0	0	(a)
Kentucky	603	489	.81	387	435	1.12	503	481	.96	52	56	1.08	162	141	.87
Michigan	778	739	.95	961	892	.93	1,473	1,385	.94	118	127	1.08	407	483	1.19
Ohio	885	1,167	1.32	1,446	1,537	1.06	1,587	1,594	1.00	156	212	1.36	0	0	(a)
Wisconsin	88	70	.80	153	121	.79	291	222	.76	30	18	.60	4	5	(a)

	1,173	820	676	70	1,322	794	60	1,511	502	46	158	92	82	14	0	18	51	3,887	2,869	74
Georgia-----	981	676	69	72	1,008	727	70	1,511	502	46	158	92	82	14	0	18	51	3,887	2,869	74
Mississippi-----	780	656	84	88	959	840	88	788	649	82	63	62	98	35	18			7,283	5,699	78
Tennessee-----																				
District 5--Total-----	1,617	1,648	1.02	1.02	1,614	1,519	.94	2,852	2,817	.99	209	232	1.11	187	316		1.69	10,635	10,087	95
Arizona-----	116	129	1.11	1.06	63	67	1.06	61	80	1.31	10	18	(a)	0	0			364	343	94
California-----	1,208	1,201	.99	.93	1,361	1,266	.93	2,286	2,271	.99	155	190	1.23	67	223		3.33	8,345	8,009	96
Nevada-----	51	44	.86	(a)	0	2	(a)	77	69	.90	3	4	(a)	31	6		.19	1,162	146	90
Oregon-----	86	119	1.38	.90	41	37	.90	103	140	1.36	2	4	(a)	51	61		1.20	522	432	83
Washington-----	122	123	1.01	1.19	103	123	1.19	149	180	1.21	12	11	(a)	26	25		.96	895	849	95
Alaska-----	12	11	(a)	(a)	7	6	(a)	2	4	(a)	0	0	(a)	1	0		(a)	158	174	110
Hawaii-----	22	21	.95	.46	39	18	.46	174	73	.42	27	5	.19	11	1		(a)	189	134	71
District 6--Total-----	217	181	.83	.74	951	700	.74	425	319	.75	312	235	.75	18	25		(a)	1,858	1,660	89
Puerto Rico-----	208	177	.85	.75	908	680	.75	418	302	.72	312	233	.75	5	23		(a)	1,820	1,636	90
Virgin Islands-----	9	4	(a)	.47	43	7	.47	7	17	(a)	0	2	(a)	13	2		(a)	38	24	63
District 7--Total-----	1,095	1,057	.97	1.02	1,169	1,189	1.02	1,619	1,596	.99	162	172	1.06	202	150		.74	3,570	3,137	88
Iowa-----	170	152	.89	1.15	177	204	1.15	313	330	1.05	36	41	1.14	33	18		.55	431	303	87
Kansas-----	178	159	.89	.75	165	123	.75	352	266	.76	34	29	.85	0	0			607	496	82
Minnesota-----	81	85	1.05	.79	58	46	.79	163	149	.91	10	13	(a)	12	3		(a)	445	337	76
Missouri-----	477	507	1.06	1.06	608	647	1.06	586	699	1.19	59	60	1.02	65	67		1.03	1,603	1,608	1.00
St. Louis-----	241	229	.95	1.14	400	456	1.14	385	482	1.25	37	31	.84	0	0			1,019	1,026	1.01
Nebraska-----	88	67	.76	.98	110	108	.98	152	100	.66	7	17	(a)	85	54		.64	225	203	90
North Dakota-----	54	46	.85	(a)	15	14	(a)	22	16	.73	9	6	(a)	6	8		(a)	97	75	77
South Dakota-----	47	41	.87	1.31	36	47	1.31	31	36	1.16	7	6	(a)	1	0		(a)	162	115	71
District 8--Total-----	310	298	.96	1.03	231	239	1.03	420	295	.70	48	34	.71	33	23		.70	965	802	83
Colorado-----	116	132	1.14	1.05	112	118	1.05	160	139	.87	20	18	.90	0	0			609	506	83
Idaho-----	60	44	.73	.38	69	26	.38	145	56	.30	12	3	(a)	18	12		(a)	145	119	82
Montana-----	81	73	.90	2.60	20	52	2.60	36	55	1.53	9	11	(a)	9	7		(a)	75	79	1.05
Utah-----	29	27	.93	.82	22	18	.82	68	25	.37	7	0	(a)	0	0		(a)	87	62	71
Wyoming-----	24	22	.92	(a)	8	25	(a)	11	20	(a)	0	2	(a)	6	4		(a)	49	36	73
District 9--Total-----	1,432	1,153	.81	.90	1,909	1,721	.90	1,471	1,341	.91	279	181	.65	2,328	3,590		1.54	10,110	10,563	1.04
New Mexico-----	123	94	.76	.70	137	96	.70	162	99	.61	40	17	.42	0	0			385	294	76
Oklahoma-----	344	271	.79	.84	496	417	.84	681	636	.93	77	48	.62	89	104		1.17	2,572	2,018	78
Texas-----	965	788	.82	.95	1,276	1,208	.95	628	606	.96	162	116	.72	2,239	3,486		1.56	7,153	8,251	1.15
Canal Zone-----	2	10	(a)	(a)	19	11	(a)	24	12	.50	1	0	(a)	1	7		(a)	159	131	82
Total continental United States-----	22,306	20,656	.93	.92	25,884	23,846	.92	31,276	29,215	.93	3,130	2,861	.91	5,606	6,876		1.23	101,828	92,058	90
Total United States and Territories-----	22,566	20,879	.93	.91	26,900	24,581	.91	31,901	29,623	.93	3,470	3,101	.89	5,637	6,909		1.23	104,192	94,157	90

<sup>a</sup>Ratio not calculated when base is less than 20.  
<sup>b</sup>Up-State morbidity estimated on the basis of clinic and in-patient care facilities' admissions.

<sup>c</sup>Data from VM-820.  
Source: Form 8058-B USPHS—Venereal Disease Division, Office of Statistics 3/16/48 (ML-RR)mjm.





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Volume 29

June 1948

Number 6

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Rule 42 of the Joint Committee on Printing**



**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.  
Price 10 cents. Subscription price: Domestic, 75 cents a year; foreign, \$1.15**



# Treatment of Neurosyphilis at Hot Springs Medical Center, Arkansas

George E. Parkhurst, Senior Surgeon,<sup>1</sup> and Richard W. Bowman, Biostatistician, United States Public Health Service<sup>2</sup>

This study presents the progress, as measured by the spinal fluid examination, of neurosyphilis patients treated with mechanical hyperthermy, malaria, or penicillin, at the Hot Springs Medical Center, Arkansas. All the 458 cases included in this study had a minimum observation period of 6 months. Excluded from the study was any early neurosyphilis case having manifestations of primary or secondary syphilis or any patient who had a fever therapy within 1 year prior to treatment being evaluated.

The hyperthermy group is composed of 12 patients, most of whom were treated during 1943 and 1944. This therapy consisted 30 to 60 hours of fever at 104° F. or above, in a Kettering hypertherm (83 percent of these patients received 40 to 50 hours at 104° F. or above).

The quartan malaria group consisted of 90 patients, most of whom were treated during 1944 and 1945. Sixty-eight percent of the patients experienced 40 to 50 hours of fever at 104° F. or above; 15 percent experienced fewer hours, and 17 percent had fewer hours at 104° F. or above.

The penicillin group consisted of 140 patients treated between June 1945 and March 1946. Total dosage was 6,000,000 units of amorphous penicillin in peanut oil and beeswax (400,000 units every 24 hours for 15 days) plus 8 injections of sodium oxides and 5 injections of bismuth administered concurrently.

Because the majority of cases in all

groups had reported wide variation in amount and type of previous arsenical and bismuth therapy, and because so little of it could be verified, no endeavor was made to classify the results of this study by either amount or type of previous treatment. The patients treated with hyperthermy and with malaria were discharged with the recommendation that additional arsenical and bismuth therapy be given at the local health department, but data are not available on the amount of treatment, if any, which was given after discharge from the Medical Center. No additional therapy was recommended for the patients treated with the penicillin schedule.

In table 1, cumulative failure rates after 24 months of posttreatment observation are shown by type of neurosyphilis and method of treatment. The cases were divided into three groups: (1) asymptomatic neurosyphilis, early and late, (2) vascular and meningovascular neurosyphilis, and (3) paresis, tabes dorsalis, and taboparesis. The failure rate was calculated by adjusting for lapses from observation, on the assumption that the same proportion of failures occurred among the cases lapsing as among those who remained under observation.

There were no significant differences in failure rates among the three types of treatment in any diagnostic group. Where a small number of cases was observed, as occurred in the later observation periods of several groups, one failure would cause a great increase in the cumulative failure rate. Since the distribution of cases by type of neurosyphilis is approximately the same for mechanical hyperthermy, malaria, and penicillin, the "total all

<sup>1</sup>Medical Officer in Charge, U. S. Public Health Service Medical Center, Hot Springs National Park, Ark.

<sup>2</sup>With the assistance of Miss Joyce Q. White, Hot Springs Medical Center.

**Table 1.—Classification of failures by type of neurosyphilis and method of treatment**

Type of neurosyphilis	Method of treatment	Total cases treated	Total cases followed 24 months	Failures by end of 24 months' observation				
				Clinical failure only	Spinal fluid failure only	Both clinical and spinal fluid failure	Total failure	Cumulative failure rate (percent)
Asymptomatic (early and late)	{ Penicillin .....	68	16	0	3	0	3	
	{ Malaria .....	102	43	1	4	1	6	
	{ Hyperthermy .....	63	32	1	2	0	3	
Vascular and meningovascular	{ Penicillin .....	14	7	1	1	0	2	
	{ Malaria .....	21	4	2	0	0	2	
	{ Hyperthermy .....	15	6	0	1	1	2	
Paresis, tabes dorsalis, and taboparesis.	{ Penicillin .....	58	30	1	4	3	8	
	{ Malaria .....	73	39	2	1	3	6	
	{ Hyperthermy .....	44	21	1	1	6	8	
Total all diagnoses .....	{ Penicillin .....	140	53	2	8	3	13	
	{ Malaria .....	196	86	5	5	4	14	
	{ Hyperthermy .....	122	59	2	4	7	13	

<sup>1</sup> The failure rate is calculated by adjusting for lapses assuming that the same proportion of failures would have occurred among the cases lapsing from observation as among those who remained under observation, and can be calculated from data presented in this condensed table.

diagnoses," which eliminates small totals, presents the best indication for comparing failure rates by type of treatment. By the end of 24 months of posttreatment observation, 11.6 percent of the patients treated with the penicillin schedule had failed, as compared with 12.6 percent following malaria and 14.3 percent following mechanical hyperthermy. On the basis of failure rates, penicillin appears equally as effective as hyperthermy or malaria in the treatment of neurosyphilis.

Lumbar spinal fluid punctures were performed prior to July 1945, but cisternal punctures became the policy after that date. Although the cell count and total protein content are lower in the cisternal specimen, the level of activity is established on the basis of the lumbar puncture with no conversion factor being employed. An active spinal fluid is defined as one in which the cell count is greater than 4 and/or the total protein is greater than 30 mg. percent. There is evidence that the total protein content increases if there is a delay of several days in testing. Therefore, specimens which were in tran-

sit several days and which exhibited only a slight abnormality in total protein were classified as inactive in the presence of a normal, immediately performed cell count. We are presently conducting a study to determine the amount of increase in total protein content between a specimen examined on the day drawn and one that is several days in transit.

Chart 1 presents the percent of cases showing activity in the spinal fluid at time of admission and at 6-month intervals for 2 years following treatment. Cases that are re-treated for either clinical or spinal fluid failure, or both, are considered active in subsequent periods. However, only a proportion of these cases is included in subsequent periods (the proportion varies with the percentage of total cases examined in a particular period). Sixty-nine percent of the cases in the mechanical hyperthermy and in the malaria groups and 83 percent of the cases in the penicillin group showed activity in the spinal fluid on admission. By 24 months following treatment, 10 percent of the malaria-treated patients

percent of the penicillin-treated patients, and 26 percent of the hyperthermia-treated patients still showed activity in the spinal fluid. Chart 1 indicates that penicillin eliminates activity in the spinal fluid more rapidly than does malaria or hyperthermy treatment.

A third comparison of penicillin, malaria, and mechanical hyperthermy is based on changes in spinal fluid groupings following each type of treatment. This is mainly a comparison of the response of the Kolmer test on spinal fluid to the methods of treatment, since grouping is usually dependent upon the degree of Kolmer positivity in dilutions and not upon activity. In defining the group-

ings of spinal fluids, the following criteria were used:

*Group III.*—Positivity (4+ or 3+) in the Kolmer complement-fixation test in 0.125 cc. of fluid (443), or greater, usually with markedly increased protein and/or cells.

*Group II.*—Kolmer positive from 0.5 cc. to 0.25 cc. (4 or 44) of spinal fluid, usually with moderately increased protein and/or cells.

*Group I.*—Those having a cell count of more than 4 and/or elevated protein above 30 mg. percent and having a negative Kolmer complement fixation.

*Negative.*—Those normal in all elements.

PERCENT  
OF CASES  
WITH ACTIVE  
SPINAL  
FLUID

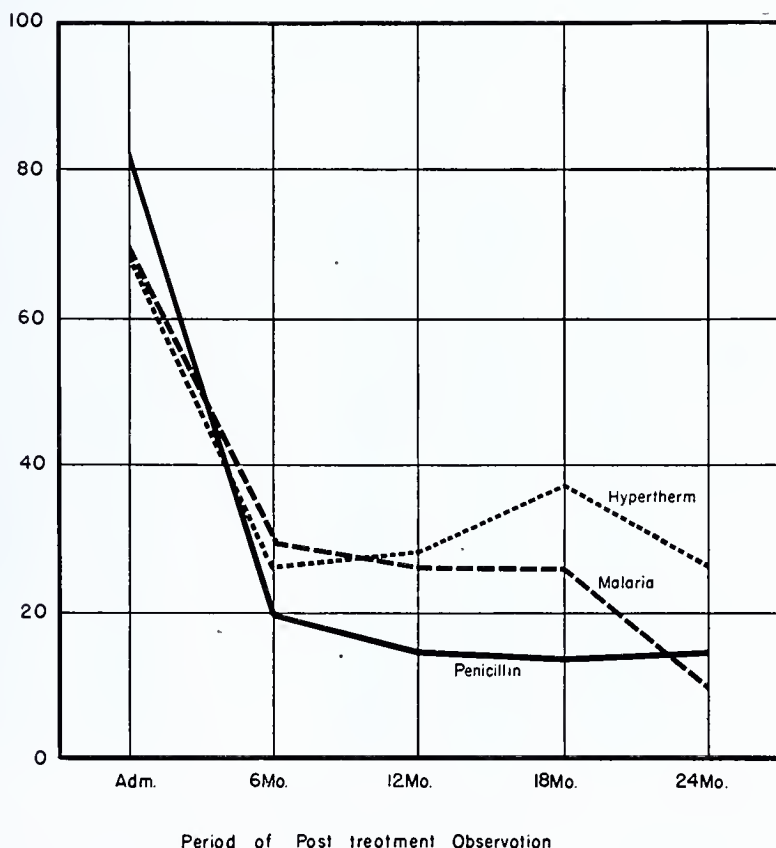


CHART 1.—Percentage of cases showing activity (abnormal cell count and/or elevated total protein mg. percent) in the spinal fluid by type of treatment and period of posttreatment observation.



Upon admission to treatment, 72 percent of the patients had a Group III spinal fluid. The following tables and charts apply only to these patients. The basic data for the charts appear in table 2.

Chart 2 shows the percentage of cases in each group at 6, 12, and 18 months after treatment. This information is given for each of the three types of therapy, for the total of all types of neurosyphilis, and for the three major groups of diagnoses. It will be seen from the bar

chart, which includes all types of neurosyphilis, that at 18 months there is very little difference between hyperthermy and malaria in spinal fluid groupings. However, in comparing hyperthermy with penicillin, it is noted that of the cases treated by hyperthermy 30 percent remained unchanged and 9 percent had retained a negative spinal fluid, as compared with 18 percent unchanged and 16 percent negative following penicillin therapy.

**Table 2.—Change in spinal fluid examination following treatment among patients having Group III spinal fluid on admission**

Type of neurosyphilis	Type of treatment	Posttreatment observation period (months)	Total cases observed (Group III on admission)	Spinal fluid classification			
				Group III	Group II	Group I	Negative
Total	Penicillin	6	118	62	46	0	10
		12	97	35	41	0	21
		18	66	12	37	0	17
	Malaria	6	135	80	51	1	3
		12	98	43	46	1	8
		18	68	20	41	0	7
	Hyperthermy	6	77	48	27	0	2
		12	65	23	40	0	2
		18	54	16	32	1	5
Asymptomatic (early and late)	Penicillin	6	57	26	22	0	9
		12	43	13	18	0	12
		18	26	3	11	0	12
	Malaria	6	67	38	27	0	2
		12	48	23	21	0	4
		18	35	7	23	0	5
	Hyperthermy	6	37	19	16	0	2
		12	30	11	17	0	2
		18	26	5	17	0	2
Vascular and meningovascular	Penicillin	6	12	7	5	0	0
		12	12	4	4	0	4
		18	8	2	5	0	1
	Malaria	6	17	11	5	0	1
		12	11	2	9	0	0
		18	5	1	4	0	0
	Hyperthermy	6	11	7	4	0	0
		12	10	3	7	0	0
		18	6	2	4	0	0
Paresis, tabes dorsalis and taboparesis.	Penicillin	6	49	29	19	0	1
		12	42	18	19	0	5
		18	32	7	21	0	4
	Malaria	6	51	31	19	1	0
		12	39	18	16	1	4
		18	28	12	14	0	2
	Hyperthermy	6	29	22	7	0	0
		12	25	9	16	0	0
		18	22	9	11	1	1

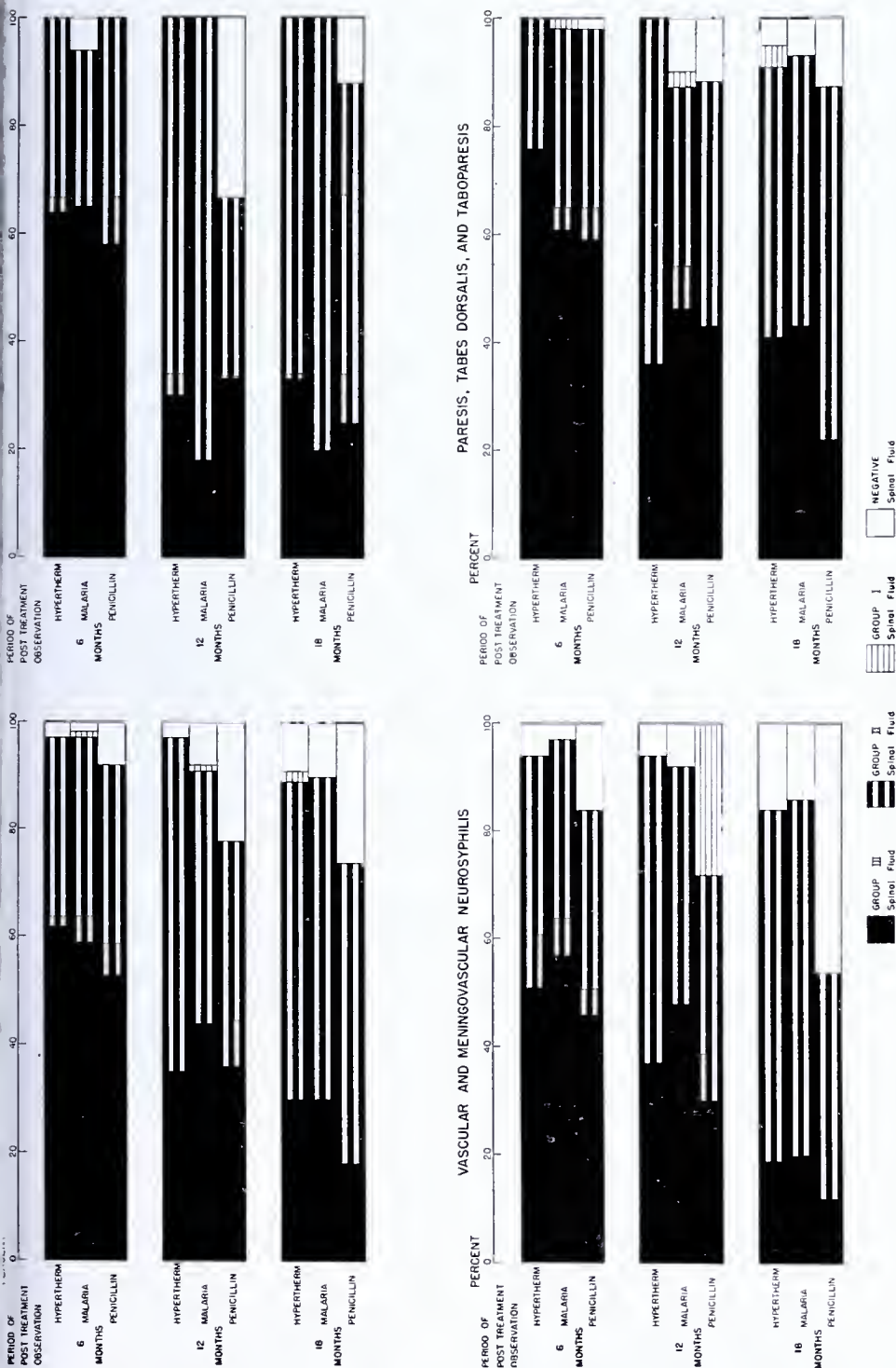


CHART 2.—Change in the spinal fluid examination following treatment among patients with Group III spinal fluid on admission.

In an attempt to show more clearly the composite change in spinal fluids, a graph (chart 3) was prepared which permits a ready comparison of the three types of therapy. Essentially it is a showing of weighted averages, which were derived by assigning weights of 3, 2, 1, and 0 to the number of fluids in Groups III, II, I, and Negative, respectively, in each of the observation periods. Thus, since only Group III patients were used, all charts show a value of 3.0 on

admission and, if they had all read negativity by 18 months, the average that time would have been zero. Reference to these charts indicates that there is little difference between malaria, mechanical hyperthermy in their respective effects on the spinal fluid, but that penicillin generally brings about more rapid and greater changes than the other two methods of treatment. If this grouping of the spinal fluid is used as an indication of improvement in neurosyphilis

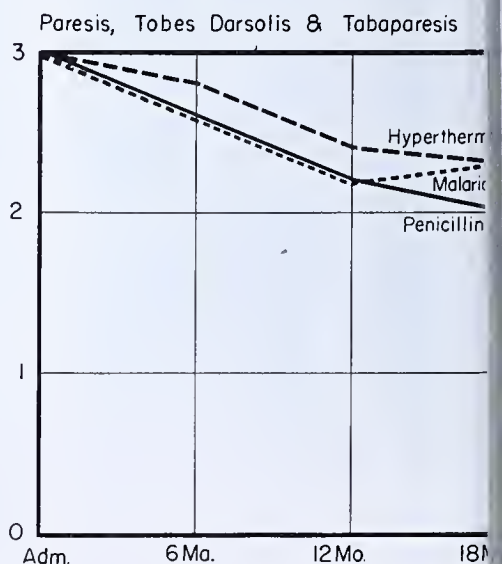
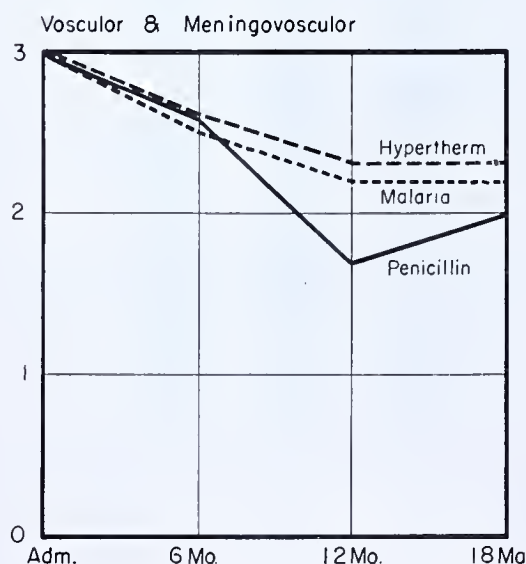
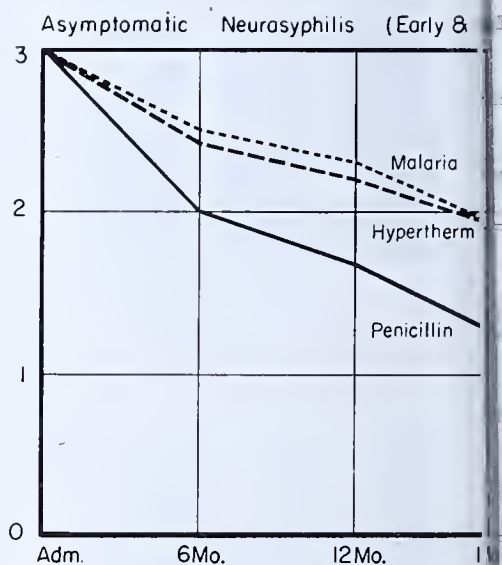
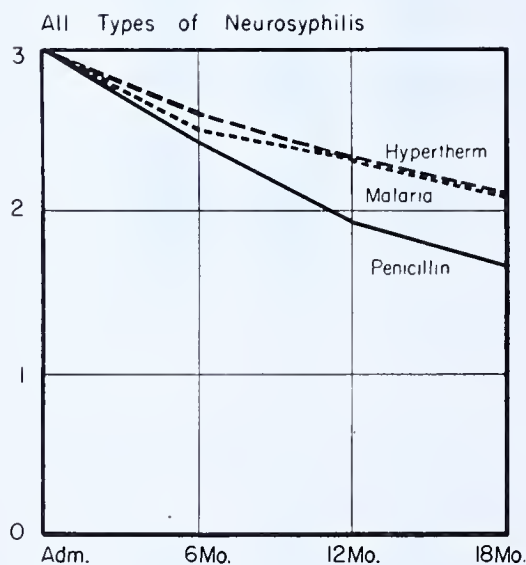


CHART 3.—Composite spinal fluid group change following treatment of patients having Group III spinal fluid on admission.



ould then appear that penicillin is the  
st effective of the three types of  
rapy.

Table 3 presents in summary form the  
results of spinal fluid tests of patients  
treated with penicillin, hyperthermy, or

**Table 3.—Course of cerebrospinal fluid abnormalities in total neurosyphilis cases treated with penicillin, malaria, or mechanical hyperthermy**

Type of treatment	Cerebrospinal fluid abnormality	Admission	Posttreatment observation period (months)			
			6	9-12	15-18	21-24
CELL COUNT						
icillin	Number cases observed	139	119	100	70	47
	Number abnormal (greater than 4)	104	9	4	0	
	Percent abnormal	74.8	7.6	4.0	0.0	2.1
alaria	Number cases observed	195	90	82	45	44
	Number abnormal (greater than 4)	119	19	17	10	3
	Percent abnormal	61.0	21.1	20.7	22.2	6.8
perthermy	Number cases observed	121	51	39	40	28
	Number abnormal (greater than 4)	79	13	7	7	2
	Percent abnormal	65.3	25.5	17.9	17.5	7.1
TOTAL PROTEIN						
icillin	Number cases observed	140	120	99	71	46
	Number abnormal (greater than 30 mg. percent)	80	21	11	6	6
	Percent abnormal	57.1	17.5	11.1	8.5	13.0
alaria	Number cases observed	194	119	92	55	54
	Number abnormal (greater than 30 mg. percent)	136	60	26	18	13
	Percent abnormal	70.1	50.4	28.3	32.7	24.1
perthermy	Number cases observed	120	58	46	47	36
	Number abnormal (greater than 30 mg. percent)	88	33	20	20	12
	Percent abnormal	73.3	56.9	43.5	42.6	33.3
COLLOIDAL GOLD						
aicillin	Number cases observed	137	117	99	70	46
	Number abnormal (greater than a "2" reaction in any tube).	83	37	26	13	6
	Percent abnormal	60.6	31.6	26.3	18.6	13.0
alaria	Number cases observed	62	64	63	27	42
	Number abnormal (greater than a "2" reaction in any tube).	36	25	16	6	8
	Percent abnormal	58.1	39.1	25.4	22.2	19.0
perthermy	Number cases observed	13	23	24	27	24
	Number abnormal (greater than a "2" reaction in any tube).	5	7	4	5	3
	Percent abnormal	38.5	30.4	16.7	18.5	12.5
KOLMER WASSERMANN						
nicillin	Number cases observed	140	118	100	71	46
	Number abnormal (greater than a negative titer)	139	103	79	47	31
	Percent abnormal	99.3	87.3	79.0	66.2	67.4
alaria	Number cases observed	197	131	104	58	56
	Number abnormal (greater than a negative titer)	197	120	88	49	40
	Percent abnormal	100.0	91.6	84.6	84.5	71.4
yperthermy	Number cases observed	121	66	51	47	39
	Number abnormal (greater than a negative titer)	119	55	44	40	27
	Percent abnormal	98.3	83.3	86.3	85.1	69.2

malaria at various periods of observation. It shows the percent of cases which are abnormal in each period for each of the four elements of the spinal fluid tested at this center. Limits, as indicated parenthetically in the table, were established for each of the elements to define abnormality. The percentage of cases which were abnormal in each of the observation periods follows the expected pattern—the cell count returning to normal first, followed by total protein, colloidal gold, and Kolmer Wassermann in that order. Penicillin-treated cases in general become normal more quickly than cases treated with malaria or hyperthermy.

Patients with early asymptomatic neurosyphilis (under 4 years) responded more favorably than patients with late asymptomatic neurosyphilis (significant at 1-percent level). Of the 24 early cases observed for 12 to 24 months, 20, or 83.3 percent, showed a negative spinal fluid test on last observation in that period. Among the late asymptomatic neurosyphi-

lis cases, 46, or 31.7 percent of the 145 cases observed between 12 and 24 months had a negative spinal fluid on last observation in that interval.

A comparison of the symptomatic cases of neurosyphilis who had had their symptoms for less than 1 year with those who had had symptoms more than 1 year gives the impression that, in general, the earlier in the period of symptomatology the case is placed under treatment, the better the response.

### Summary

1. On the basis of failure rates, penicillin appears equally as effective as the Kettering hypertherm and malaria in the treatment of neurosyphilis.

2. Penicillin eliminates activity in the spinal fluid more rapidly than does hyperthermy or malaria treatment.

3. By the end of 18 months of observation, penicillin treatment reduces the Kolmer test to negativity in a greater percentage of cases than does malaria hyperthermy treatment.

## Cardiolipin Antigens in the Kolmer Complement Fixation Test for Syphilis<sup>1</sup>

John A. Kolmer, M. D., and Elsa R. Lynch, M. T. (ASCP)

The purpose of this investigation was to determine the optimum percentages of cardiolipin, lecithin, and cholesterol to employ as antigen in the Kolmer complement-fixation test for obtaining reactions of maximum sensitivity consistent with specificity, with the sera of normal nonsyphilitic individuals. In a study of 23 cardiolipin antigens of different composition, Harris and Portnoy (1) found

combinations of 0.03-0.05-0.3, 0.03-0.06, 0.3-0.05-0.9, 0.06-0.05-0.3, 0.06-0.06, and 0.06-0.05-0.9 of maximum sensitivity. In the 1944 National Serology Evaluation Survey these investigators also observed that a combination of 0.03-0.05-0.3 as antigen in the Kolmer complement fixation test gave a sensitivity rating of 83.2 percent and a Kolmer antigen a rating of 83.6 percent with the sera of syphilitic donors; and that the cardiolipin antigen gave a specificity rating of 100 percent and the Kolmer antigen 99.7 percent with the sera of presumably normal nonsyphilitic donors (1). In the

<sup>1</sup>From the Research Institute of Cutaneous Medicine and the Department of Bacteriology and Immunology, Temple University School of Medicine, Philadelphia, Pennsylvania.

urvey the Kolmer complement fixation st gave a sensitivity rating of 85.5 per-  
nt and a specificity rating of 99.4 per-  
nt in the laboratory of its author-serolo-  
st. This was the first time in yearly  
rologic surveys from 1935 to 1943, in-  
uding the Washington serology confer-  
ce of 1941 and totaling 1,116 sera of  
esumably normal nonsyphilitic donors,  
at the Kolmer test failed to give 100  
cent specificity in the laboratory of  
s author-serologist (2).

Reagents and Methods

A stock 0.2-percent solution of cardio-  
lipin in absolute ethyl alcohol (No. 2461-  
:) and a stock 1-percent solution of  
cithin (beef heart) in absolute ethyl  
cohol (No. 2527-34), prepared by a com-  
ercial laboratory, were employed (both  
agents were supplied by the Venereal  
isease Research Laboratory). A stock  
percent solution of C. P. cholesterol  
fanstiehl) in absolute ethyl alcohol  
as prepared by the authors. From these  
ock solutions, 39 different cardiolipin  
togens of varying composition were pre-  
red as shown in table 1.  
All titrations and complement fixation  
sts were conducted according to the  
chnic of the Kolmer complement fixa-  
on test (3); pooled dried complement  
repared by a commercial laboratory was  
mployed.

Antigenic Activity of Cardiolipin, Leci-  
thin, and Cholesterol Mixtures

The results of antigenic titrations are  
shown in table 2. It will be observed  
that 0.3-percent cardiolipin alone in ab-  
solute alcohol (No. 1) is so low in sensi-  
tivity that it cannot be used as antigen  
in the Kolmer complement fixation test.  
Although the addition of 0.05-percent  
lecithin to 0.03-percent cardiolipin (No.  
2) and to 0.06-percent cardiolipin (No. 3)  
increases sensitivity to some extent, both  
antigens are, likewise, too low in sensi-  
tivity for practical use in this test. A  
mixture of 0.03-percent cardiolipin with  
0.3-percent cholesterol (No. 4), however,  
was much more sensitive with further en-  
hancement of antigenicity by sensitiza-  
tion of the cardiolipin with 0.6- and 0.9-  
percent cholesterol (Nos. 5 and 6). Fur-  
thermore, although the sensitivity of an-  
tigen 4 (0.03—0—0.3) was practically the  
same as antigen 7 (0.06—0—0.3), sensi-  
tivity was markedly increased in antigen  
8 (0.15—0—0.6) with slight additional  
sensitivity in antigen 9 (0.3—0—0.6). A  
mixture of 0.05-percent lecithin with 0.3-  
percent cholesterol (No. 10) was very low  
in sensitivity although antigenicity was  
slightly increased by 0.6- and 0.9-percent  
cholesterol (Nos. 11 and 12).  
In mixtures containing 0.01- to 0.3-  
percent cardiolipin with 0.05-percent lec-  
ithin and 0.3-percent cholesterol, sensi-

Table 1.—Composition of cardiolipin antigens

No.	Composition			No.	Composition			No.	Composition		
	Cardio- lipin	Leci- thin	Choles- terol		Cardio- lipin	Leci- thin	Choles- terol		Cardio- lipin	Leci- thin	Choles- terol
	Percent	Percent	Percent		Percent	Percent	Percent		Percent	Percent	Percent
0.3	0	0	14	0.02	0.05	0.3	27	0.03	0.05	0.1	
.03	.05	0	15	.03	.05	.3	28	.03	.05	.2	
.06	.05	0	16	.04	.05	.3	29	.03	.05	.4	
.03	0	.3	17	.05	.05	.3	30	.03	.05	.5	
.03	0	.6	18	.06	.05	.3	31	.03	.05	.6	
.03	0	.9	19	.08	.05	.3	32	.03	.05	.7	
.06	0	.3	20	.1	.05	.3	33	.03	.05	.9	
.15	0	.6	21	.3	.05	.3	34	.03	.5	.6	
.3	0	.6	22	.03	.1	.3	35	.03	.5	.9	
0	.05	.3	23	.03	.2	.3	36	.06	.05	.6	
0	.05	.6	24	.03	.3	.3	37	.06	.05	.9	
0	.05	.9	25	.03	.4	.3	38	.3	.05	.6	
.01	.05	.3	26	.03	.5	.3	39	.0175	.0875	.3	



tivity was progressively increased in antigens containing 0.01- to 0.06-percent cardiolipin (Nos. 13 to 18) with a progressive reduction in sensitivity in mixtures containing 0.08- to 0.3-percent cardiolipin (Nos. 19 to 21), although a mixture of 0.3-0.05-0.6 (No. 38) was slightly more sensitive than a mixture of 0.3-0.05-0.3 (No. 21) due to the higher percentage of cholesterol.

In mixtures containing 0.03-percent cardiolipin, 0.3-percent cholesterol, and 0.1- to 0.5-percent lecithin (Nos. 22 to 26), sensitivity was progressively reduced by the increasing amounts of lecithin, probably because of the hemolytic activity of this lipid. Furthermore, sensitivity was not increased by using 0.6- and 0.9-percent cholesterol, as shown by mixtures of 0.03-0.5-0.6 (No. 34) and 0.03-0.5 and 0.9 (No. 35).

In mixtures containing 0.03-percent cardiolipin, 0.05-percent lecithin, and 0.1- to 0.9-percent cholesterol (Nos. 27 to 33), sensitivity was progressively increased in antigens containing 0.1- to 0.6-percent cholesterol (Nos. 27 to 31) with no additional increase of sensitivity in those containing 0.7- and 0.9-percent cholesterol (Nos. 32 and 33). On the basis of these titrations alone, antigen 36 (0.06-0.05-0.6) showed the highest sensitivity in the series with no increase of sensitivity by using 0.9-percent cholesterol.

A final decision, however, on the optimum mixture or mixtures of cardiolipin, lecithin, and cholesterol to use as antigen in the Kolmer complement fixation test must also take into consideration not only the anticomplementary activity of various mixtures but also their capacity for yielding nonspecific or prezone reactions as well, including comparative studies of selected mixtures in actual complement fixation tests with the sera and spinal fluids of syphilitic and normal individuals.

#### **Anticomplementary Activity of Cardiolipin Antigens**

Each cardiolipin antigen was titrated for anticomplementary activity, and the results are shown in table 3. In these

titrations the antigens were used in doses of 0.5 cc. of dilutions in normal saline solution varying from 1:10 to 1:2560 with the hemolytic system of the Kolmer complement fixation test.

In general terms, 0.01 to 0.03-percent cardiolipin in mixtures with 0.05-percent lecithin and 0.3-percent cholesterol (Nos. 13 to 15) were slightly anticomplementary (1:20) with slightly more marked anticomplementary activity (1:40) in mixtures containing 0.04 and 0.05 percent (Nos. 16 and 17), and still more (1:80 to 1:160) in mixtures containing 0.06 to 0.3-percent cardiolipin (Nos. 18 to 21).

Anticomplementary activity is also a function of the percentage of cholesterol employed. Thus, in mixtures of 0.03-percent cardiolipin, 0.05-percent lecithin, and 0.1 to 0.3-percent cholesterol the anticomplementary units were 0.5 cc. of 1:20 (Nos. 15, 27, and 28) with a unit of 1:40 in mixtures containing 0.4- to 0.6-percent cholesterol (Nos. 29 to 31) and a unit of 1:80 in mixtures containing 0.7- and 0.9-percent cholesterol (Nos. 32 and 33).

Anticomplementary activity is similarly a function of the lecithin content of cardiolipin mixtures in view of its hemolytic activity resulting in hemolysis in spite of the inactivation or destruction of complement by anticomplementary substances. Thus, 0.05-percent lecithin apparently nullifies the slight anticomplementary activity of cardiolipin as observed with antigens 2 and 3 as, likewise, reducing the anticomplementary effects of cholesterol (Nos. 10 to 12). The same influence was observed in antigens 22 to 26 containing 0.03-percent cardiolipin and 0.3-percent cholesterol with 0.1- to 0.5-percent lecithin as, likewise, in antigens 34 and 35 containing 0.03-percent cardiolipin, 0.5-percent lecithin, and 0.6 and 0.9-percent cholesterol, respectively.

#### **Prezone Reactions by Cardiolipin Antigens**

Prezone complement fixation reactions are not a function of the anticomplementary







Table 3.—*Anticomplementary activity of cardiolipin antigens*

No.	Antigen: 0.5 cc. of—										No.	Antigen: 0.5 cc. of—									
	1:10	1:20	1:40	1:80	1:160	1:320	1:640	1:1280	1:2560	1:10		1:20	1:40	1:80	1:160	1:320	1:640	1:1280	1:2560		
1	4	±	—	—	—	—	—	—	—	21	4	4	4	2	±	—	—	—	—		
2	—	—	—	—	—	—	—	—	—	22	±	—	—	—	—	—	—	—	—		
3	—	—	—	—	—	—	—	—	—	23	—	—	—	—	—	—	—	—	—		
4	4	—	—	—	—	—	—	—	—	24	4	—	—	—	—	—	—	—	—		
5	4	—	—	—	—	—	—	—	—	25	—	—	—	—	—	—	—	—	—		
6	4	±	4	4	4	4	—	—	—	26	—	—	—	—	—	—	—	—	—		
7	4	4	4	±	—	—	—	—	—	27	2	—	—	—	—	—	—	—	—		
8	4	4	4	4	3	±	—	—	—	28	4	1	—	—	—	—	—	—	—		
9	4	4	4	4	1	—	—	—	—	29	4	3	—	—	—	—	—	—	—		
10	4	4	4	4	—	—	—	—	—	30	4	4	4	—	—	—	—	—	—		
11	1	—	—	—	—	—	—	—	—	31	4	4	4	—	—	—	—	—	—		
12	1	—	—	—	—	—	—	—	—	32	4	4	4	±	—	—	—	—	—		
13	3	±	—	—	—	—	—	—	—	33	4	4	4	2	—	—	—	—	—		
14	1	±	—	—	—	—	—	—	—	34	—	—	—	—	—	—	—	—	—		
15	2	1	—	—	—	—	—	—	—	35	4	—	—	—	—	—	—	—	—		
16	4	1	—	—	—	—	—	—	—	36	4	4	—	—	—	—	—	—	—		
17	4	4	±	—	—	—	—	—	—	37	4	4	±	—	—	—	—	—	—		
18	4	4	2	1	—	—	—	—	—	38	4	4	2	±	—	—	—	—	—		
19	4	4	4	1	—	—	—	—	—	39	4	4	4	—	—	—	—	—	—		
20	4	4	4	2	—	—	—	—	—			1	—	1	—	—	—	—	—		

tary effects of the antigens employed. As shown in table 2, however, 12 in the series of 39 cardiolipin antigens employed in this study have shown slight prezone reactions in the antigen titrations (Nos. 15, 18, 21, 26, 31 to 38), and similar reactions were observed by Harris and Portnoy (1) with 11 in their series of 23 antigens. It is difficult to correlate these prezone reactions with the composition of the different mixtures of cardiolipin, lecithin, and cholesterol. Thus, antigen 15 (0.03-0.05-0.3) showed a slight prezone reaction, while others contained larger amounts of cardiolipin (Nos. 18, 21), a larger amount of lecithin (No. 26), or larger amounts of cholesterol (Nos. 31 to 33). Additional mixtures of varying composition (Nos. 34 to 38) also showed slight evidences of prezone reactions in these titrations.

Cardiolipin Antigens for the Kolmer Complement Fixation Test

It is axiomatic that the cardiolipin antigen or antigens to be employed in any of the complement fixation or flocculation tests for syphilis should possess the maximum of sensitivity consistent with specificity or freedom from falsely positive nonspecific reactions with the sera and spinal fluids of presumably normal non-syphilitic individuals. Insofar as complement fixation tests are concerned, they should also possess the minimum of anti-

complementary activity. Apparently mixtures of cardiolipin, lecithin, and cholesterol are to be preferred to mixtures of cardiolipin and cholesterol alone insofar, at least, as complement fixation tests are concerned.

Table 4 has been compiled as an aid in selecting the best mixtures for the Kolmer complement fixation test on the basis of the results of antigenic and anticomplementary titrations. In compiling the data on antigenic activity, all the numbers indicating the degree of complement fixation in the titration of any given antigen shown in table 2 were added together and expressed as the "antigenic score" with (+) regarded as plus 1. The anticomplementary unit of each antigen is also shown, (—) indicating that there was no evidence of anticomplementary activity in a dose of 0.5 cc. of 1:10 and higher dilutions. The presence or absence of prezone reactions in the antigenic titration is also listed.

From the results of titrations antigens 31, 32, 33, 36, and 37 were found most antigenic with anticomplementary units of 1:40 to 1:80. Four of these antigens (Nos. 31, 33, 36, and 37) were also reported by Harris and Portnoy (1) as showing the highest sensitivity in their investigation, so that our results not only confirm their observations but likewise their conclusion that antigens of acceptable sensitivity for the Kolmer comple-

Table 4.—Comparative antigenic, anticomplementary, and nonspecific activity of cardiolipin antigens

No.	Activity			No.	Activity			No.	Activity		
	A <sup>1</sup>	AC <sup>2</sup>	P <sup>3</sup>		A <sup>1</sup>	AC <sup>2</sup>	P <sup>3</sup>		A <sup>1</sup>	AC <sup>2</sup>	P <sup>3</sup>
1-----	3	1:20	—	14-----	49	1:20	—	27-----	45	1:10	—
2-----	12	—	—	15-----	51	1:20	+	28-----	48	1:20	—
3-----	13	—	—	16-----	55	1:40	—	29-----	70	1:40	—
4-----	53	1:20	—	17-----	62	1:40	—	30-----	81	1:40	—
5-----	61	1:20	—	18-----	70	1:80	+	31-----	89	1:40	+
6-----	85	1:640	—	19-----	65	1:80	—	32-----	86	1:80	+
7-----	52	1:80	—	20-----	50	1:80	—	33-----	85	1:80	+
8-----	83	1:320	—	21-----	44	1:160	+	34-----	34	—	+
9-----	90	1:160	—	22-----	48	1:10	—	35-----	36	—	+
10-----	4	1:10	—	23-----	46	1:10	—	36-----	93	1:40	+
11-----	8	1:10	—	24-----	43	1:10	—	37-----	82	1:80	+
12-----	12	1:10	—	25-----	40	—	—	38-----	55	1:160	+
13-----	45	1:20	—	26-----	36	—	+	39-----	35	1:20	—

<sup>1</sup> A—Antigenic score.                      <sup>2</sup> AC—Anticomplementary unit.                      <sup>3</sup> P—Prezone reactions.

ent fixation test are found in the group containing 0.03- to 0.06-percent cardi-  
olipin, 0.3- to 0.6-percent cholesterol, and  
approximately 0.05-percent lecithin. They  
also found antigen 15 (0.03—0.05—0.3)  
satisfactory for the Kolmer complement  
fixation test, but in our study this mixture  
was less sensitive than antigens 16 to 19,  
30, and 38, although satisfactory in  
complement fixation tests with syphilitic  
sera.

Experience has shown, however, that  
antigens cannot be completely evaluated  
on the basis of titrations alone. Actual  
tests with syphilitic sera containing vary-  
ing amounts of reagin are so important  
to be practically essential. Further-  
more, it is always advisable likewise to  
conduct actual tests with the sera of pre-  
sumably normal nonsyphilitic individuals  
for possible falsely positive reactions.  
For this reason we have conducted  
Kolmer complement fixation tests with

antigens 15, 31, 33, 36, and 37 in doses  
of 0.5 cc. of 1:150 dilutions using undi-  
luted syphilitic serum and the same serum  
diluted with normal serum 1:5, 1:10,  
1:20, 1:40, and 1:80. The results ob-  
served with antigens 15, 31, and 36 are  
shown in table 5. Antigens 31, 33, and  
37 were tested in the same manner but  
with a different stock of syphilitic serum,  
with the results shown in table 6. Of  
these five antigens it will be observed that  
No. 31 (0.03—0.05—0.6) proved most anti-  
genic although No. 15 (0.03—0.05—0.3)  
was only slightly less sensitive in these  
tests even though much less sensitive in  
the antigen titration.

Antigens 15, 31, 33, 36, 37, and 39 in  
doses of 0.5 cc. of 1:150 dilutions were  
also tested with individual syphilitic sera  
containing varying amounts of reagin,  
with the results shown in tables 7 and 8.  
In these tests antigen 31 was likewise  
found most sensitive.

**Table 5.—Comparative sensitivity of cardiolipin antigens**

Parts serum—		Antigens <sup>1</sup>		
Positive	Negative	No. 15 <sup>2</sup>	No. 31 <sup>3</sup>	No. 36 <sup>4</sup>
Undiluted	-----	4 4 4 2 — —	4 4 4 4 — —	4 4 4 3 — —
1 +	4 -----	4 3 — — — —	4 ± — — — —	4 ± — — — —
1 +	9 -----	4 — — — — —	4 2 — — — —	3 — — — — —
1 +	19 -----	3 — — — — —	3 — — — — —	3 — — — — —
1 +	39 -----	— — — — — —	— — — — — —	— — — — — —
1 +	79 -----	— — — — — —	— — — — — —	— — — — — —

<sup>1</sup> Each in dose of 0.5 cc. of 1:150 dilution.

<sup>2</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.3.

<sup>3</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.6.

<sup>4</sup> Cardiolipin, 0.06; lecithin, 0.05; cholesterol, 0.6.

**Table 6.—Comparative sensitivity of cardiolipin antigens**

Parts serum—		Antigens <sup>1</sup>		
Positive	Negative	No. 31 <sup>2</sup>	No. 33 <sup>3</sup>	No. 37 <sup>4</sup>
Undiluted	-----	4 4 4 4 — —	4 4 4 4 — —	4 4 4 2 — —
1 +	4 -----	4 4 4 3 — —	4 3 3 — — —	3 2 — — — —
1 +	9 -----	1 ± — — — —	3 — — — — —	— — — — — —
1 +	19 -----	— — — — — —	— — — — — —	— — — — — —
1 +	39 -----	— — — — — —	— — — — — —	— — — — — —
1 +	79 -----	— — — — — —	— — — — — —	— — — — — —

<sup>1</sup> Each in dose of 0.5 cc. of 1:150 dilution.

<sup>2</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.6.

<sup>3</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.9.

<sup>4</sup> Cardiolipin, 0.06; lecithin, 0.05; cholesterol, 0.9.



**Table 7.—Comparative sensitivity of cardiolipin antigens**

Syphilis serums	Antigens <sup>1</sup>				
	No. 15 <sup>2</sup>	No. 31 <sup>3</sup>	No. 33 <sup>4</sup>	No. 36 <sup>5</sup>	No. 37 <sup>6</sup>
1-----	4 4 4 4 4 —	4 4 4 4 4 —		4 4 4 4 3 —	
2-----	4 4 4 — — —	4 4 4 — — —		4 4 4 — — —	
3-----	— — — — —	1 ± — — — —		— — — — —	
4-----	4 — — — — —	4 4 — — — —		4 — — — — —	
5-----	4 4 3 — — —	4 4 4 — — —		4 4 ± — — —	
6-----	4 4 4 4 — —	4 4 4 4 — —		4 4 4 4 — —	
7-----		4 4 4 — — —	4 ± — — — —		4 4 — — — —
8-----		4 4 4 4 — —	4 4 2 — — —		4 4 4 2 — —
9-----		4 4 4 4 — —	4 4 4 4 ± —		4 4 4 4 — —
10-----		4 4 4 4 2 —	4 4 4 4 — —		4 4 4 4 4 —
11-----		4 4 4 4 4 —	4 4 4 4 4 —		4 4 4 4 4 —
12-----		4 4 4 4 — —	4 4 3 ± — —		4 4 4 4 — —

<sup>1</sup> Each in dose of 0.5 cc. of 1:150 dilution.

<sup>2</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.3.

<sup>3</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.6.

<sup>4</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.9.

<sup>5</sup> Cardiolipin, 0.06; lecithin, 0.05; cholesterol, 0.6.

<sup>6</sup> Cardiolipin, 0.06; lecithin, 0.05; cholesterol, 0.9.

**Table 8.—Comparative sensitivity of cardiolipin antigens**

Syphilis serums	Antigens <sup>1</sup>		Syphilis serums	Antigens <sup>1</sup>	
	No. 31 <sup>2</sup>	No. 39 <sup>3</sup>		No. 31 <sup>2</sup>	No. 39 <sup>3</sup>
1	4 4 1 — — —	4 4 — — — —	7	4 4 4 4 4 —	4 4 4 4 4 —
2	4 4 4 4 — —	4 4 4 4 — —	8	4 4 2 — — —	4 4 — — — —
3	4 3 — — — —	4 3 — — — —	9	4 4 4 1 — —	4 4 4 — — —
4	4 4 4 4 — —	4 4 4 4 — —	10	1 ± — — — —	± — — — — —
5	4 4 4 — — —	4 4 3 — — —	11	4 4 4 4 — —	4 4 4 4 — —
6	4 4 4 4 1 —	4 4 4 4 — —	12	4 2 1 — — —	4 1 — — — —

<sup>1</sup> Each in dose of 0.5 cc. of 1:150 dilution.

<sup>2</sup> Cardiolipin, 0.03; lecithin, 0.05; cholesterol, 0.6.

<sup>3</sup> Cardiolipin, 0.0175; lecithin, 0.0875; cholesterol, 0.3.

Antigens 15, 36, and 37 were also tested in doses of 0.5 cc. of 1:150 dilutions with the sera of 12 presumably normal nonsyphilitic individuals; all gave completely negative reactions. Similar results were observed with antigen No. 31 in tests with 73 sera, and antigen No. 39 in tests with 33 sera. Tests were also conducted with the spinal fluids of 10 presumably normal nonsyphilitic individuals with antigens 15, 36, and 37, and all gave completely negative reactions; similar results were observed with antigens 31 and 39 in tests employing 18 normal spinal fluids.

### Conclusions

1. In the Kolmer complement fixation tests for syphilis, cardiolipin-lecithin-cholesterol mixtures of 0.03–0.05–0.3, 0.03–0.05–0.6, 0.03–0.05–0.9, 0.06–0.05–0.6, 0.06–

0.05–0.9, and 0.0175–0.0875–0.3 may be employed as antigens in doses of 0.5 cc. of 1:150 dilutions.

2. In general terms, an antigen prepared of 0.03-percent cardiolipin, 0.05-percent lecithin, and 0.6-percent cholesterol is preferred as a mixture of maximum sensitivity consistent with specificity tests with sera and spinal fluids.

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# Administrative Advantages of Rapid Syphilotherapy on an Out-Patient Basis

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The San Joaquin Local Health District serves the entire population of San Joaquin County, California—roughly 200,000 people. The population is both urban and rural, and is primarily agricultural. A fairly large percentage of the population is comprised of seasonal workers who follow the crops in various parts of the state. For this reason the authors have been continuously interested in methods of providing adequate treatment for syphilis in the shortest possible time. Early in 1945 a contract was made with the county hospital to give 10-day rapid treatment to in-patients with infectious syphilis; and in the summer of 1945 the 26-week Army schedule (40 arsenical and 16 bismuth injections) was adopted by the health department clinic for out-patients. Although the 26-week schedule offered definite advantages over the longer traditional regimen of therapy (1 year to 18 months), a high percentage of cases was lost before receiving adequate treatment. Papers presented at the United States Public Health Service Venereal Disease Control Seminar held in San Francisco in July of 1946 offered hope of using penicillin in peanut oil and beeswax, five arsenicals, and three injections of bismuth to treat all types of syphilis on an out-patient basis. Accordingly, in July 1946 this new program of treatment was adopted in San Joaquin for all cases of syphilis excepting cardiovascular. In September of 1947 the schedule was changed to double the total dosage of penicillin in oil and beeswax, without arsenic or bismuth.

It is the purpose of this paper to present the administrative advantages of the penicillin schedules on an out-patient basis.

## Comparative Costs

### *20 Arsenic-20 Bismuth*

A minimum standard under the old arsenic-bismuth therapy has been designated as not less than 20 arsenical and 20 bismuth injections administered at regular intervals in the course of one year (1). In this study, comparative costs for this type of therapy have been based on the minimum standard.

It should be remembered, however, that the comparison is an arbitrary one which, for purposes of analysis, assumes that more than 90 percent of the patients received 20 arsenical and 20 bismuth injections. Actually, only 1 in 4 patients received such protective therapy, as we indicate later in the study. The time and drugs wasted on lapsed patients, if charged against patients completing therapy, would add greatly to the cost per adequately treated patient.

Prior to July 1946, 2 clinic sessions a week had been held for the diagnosis and treatment of syphilis; Monday mornings from 9:00 a. m. to 12:00 noon and Wednesday afternoons from 1:00 p. m. to 6:00 p. m., a total of 8 clinic hours a week. One clinician handled most of the cases, and 2 nurses were employed for each clinic, plus 2 clerks, a nurse-epidemiologist, and a statistical secretary. The preparation of supplies and syringes by the nurses demanded at least 4 additional hours a week. At wages prevailing at that time, it has been calculated that

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the cost per patient receiving 20 arsenical and 20 bismuth injections was \$25.24 and the cost of the drugs \$1.59, or a total cost of \$26.83, including all professional and clerical time and drugs, but excluding laboratory work. The calculation was done by dividing the average number of injections given per week to all patients into total weekly salaries; this cost per injection was then multiplied by 40 (20 plus 20).

### *In-Patient Therapy*

From January 1945 to December 31, 1947, a total of 294 in-patients had been treated at the San Joaquin General Hospital with the rapid 10-day schedule of 1,800,000 units of aqueous penicillin, 5 arsenicals, and 3 bismuth injections (5-18-3). The average hospital stay was 11 days, at a cost of \$6.50 per patient day and a cost of drugs of \$6.27 per course of treatment, or a total cost of \$77.77 per patient treated.<sup>2</sup>

### *Penicillin Out-Patient Therapy*

From July 22, 1946, to December 31, 1947, a total of 437 syphilitics had been treated on an out-patient basis with penicillin in POB, both with and without conjunctive drugs. Not enough time has elapsed to evaluate the clinical results of this therapeutic regime, but for purposes of analysis it has been assumed that 3,000,000 units of penicillin in POB administered in daily doses of 300,000 units for 10 days plus 5 intravenous injections of mapharsen and 3 intramuscular injections of bismuth subsalicylate, or 6,000,000 units of penicillin in POB administered daily for 10 days in doses of 600,000 units represent adequate treatment.

With the adoption of the out-patient schedule using 3,000,000 units of penicil-

lin in POB, 5 arsenicals, and 3 bismuth (5-30-3 POB), many advantages were noted in the saving of personnel time and effort. All clerical time formerly devoted to writing follow-up letters to lapsing patients under the old arsenic-bismuth regime was freed for other services. The clinician was enabled to devote more time to clinical history, physical examination, spinal puncture, and diagnosis, and less time to treatment reactions and other clinical problems associated with the traditional treatment method. A second nurse who administered bismuth is no longer employed.

In table 1, it can be seen that with the 5-30-3 POB schedule the personnel cost per patient was almost halved from that of the long-term schedule. The cost of penicillin, however, is greater than the combined cost of arsenic and bismuth used in the older regime, so that the total cost per patient treated with the 5-30 POB schedule is \$20.56.

The 5-30-3 POB schedule had one disadvantage in that patients had to be treated in groups or "classes," starting on alternate Mondays, in order to allow the clinician to have every other week end free. It was necessary to have a doctor and a nurse on duty on those Sundays when arsenicals were administered. On the basis of accumulated evidence, it was decided in September of 1947 to eliminate the arsenicals and bismuth and to double the dosage of penicillin (0-60 POB). This change made it possible to start a patient on therapy on the day of diagnosis and removed the necessity of physician being present on Sundays, inasmuch as the nurses administered the penicillin injections. Elimination of the use of arsenic and bismuth also reduced nursing time considerably, which further reduced personnel costs.

Although it is obvious in table 1 that the saving in personnel time is not actually reflected in the total budget of the department, inasmuch as only the second part-time nurse was separated from the service, the staff members do have more time to devote to other public health activities, which certainly is a saving in

<sup>2</sup> For several reasons, this in-patient cost is higher than the average throughout the country. For the same period, the average cost per in-patient treated for syphilis in all hospital facilities was approximately \$55.00.



Table 1.—Comparative costs per patient of four methods of syphilotherapy, in San Joaquin County, California

	Methods of therapy			
	Traditional arsenic-bismuth (20-20)	In-patient (5-18-3)	Out-patient (5-30-3 POB)	Out-patient (0-60-0 POB)
Costs per patient:				
Personnel.....	\$25.24	\$71.50	\$12.73	\$9.65
Drugs:				
Penicillin.....		5.94	7.50	15.00
Arsenic and bismuth.....	1.59	.33	.33	
Total cost per patient.....	\$26.83	\$77.77	\$20.56	\$24.65

the cost of syphilis therapy. At the present price of penicillin in POB, these outpatient methods of syphilis therapy are economical to administer as any other method.

### Efficiency of Method

The objectives of all public health clinics treating syphilis are to discover the patients early in their infection, to render them noninfectious promptly, and to give enough therapy to prevent serologic or mucocutaneous relapse and later complications. Furthermore, in a community

where there is only one clinic, treatment of latent and late syphilis is an unavoidable obligation.

On the basis of the percentage of patients completing a course of adequate therapy, it appears that rapid outpatient therapy in the clinic is far superior in efficiency to the traditional method of treatment. For purposes of comparison, the experience of the San Joaquin Local Health District clinic was analyzed for 1940. The charts of all patients diagnosed and started on treatment in 1940 were studied. Table 2 shows the results of comparison with rapid therapy in the clinic.

Table 2.—Comparative percentages of patients completing syphilotherapy under traditional and rapid outpatient methods

	Traditional arsenic-bismuth (1940)			Rapid outpatient therapy with penicillin in POB (1946-1947)		
	Number of patients who started treatment	Patients who completed treatment		Number of patients who started treatment	Patients who completed treatment	
		Number	Percent		Number	Percent
Diagnosis:						
Primary.....	19	5	26.3	27	23	85.2
Secondary.....	13	3	23.1	20	19	95.0
Early latent.....	39	12	30.8	129	124	96.1
Late latent.....	126	28	22.2	179	176	98.3
Central nervous system.....	8	4	50.0	65	64	98.5
Cardiovascular.....	5	3	60.0	1	0	0.0
Congenital.....	12	4	33.3	16	16	100.0
Total.....	222	59	26.6	437	422	96.6

Fifteen patients failed to complete treatment with penicillin in POB for the following reasons:

- (a) 6 failed to report after therapy started and could not be located.
- (b) 2 left the jurisdiction (1 of these completed treatment in another city).
- (c) 5 developed allergic reactions, and treatment was discontinued.
- (d) 1 died (the case of cardiovascular syphilis).
- (e) 1 aborted (not attributed to penicillin) and treatment was discontinued.

### Reactions

One pregnant patient, referred to us by her private physician for syphilis therapy, had a severe attack of nausea and vomiting on the fifth day. She was treated for the nausea by her own physician and continued on syphilis treatment in the clinic. Seven patients developed urticarial reactions during treatment; 2 of these reaction cases were controlled with benadryl and local applications and 5 were discontinued from treatment. Seven patients had allergic reactions after completion of treatment; all but 1 patient responded to benadryl, and he was hospitalized for 3 days. Only 1 patient known to have cardiovascular syphilis was treated by this method; she developed marked cardiac embarrassment on the third day, was hospitalized and died on the fifth day. Thus, 16 patients among the 437 patients treated with penicillin in POB had reactions, or 3.7 percent.

No untoward muscle soreness was encountered, but it should be pointed out that 3-inch needles are used and the penicillin is given deep in the gluteal muscles.

### Patient Response

As compared with traditional treatment, patients welcome the penicillin therapy, partly because of the wide popular knowledge of penicillin and partly because of the greater convenience. Many patients diagnosed as having primary or

secondary syphilis prefer the out-patient regime to the hospital treatment, because they may remain on their jobs and thus avoid loss of income as well as the stigma of 10-day treatment in the hospital. The choice is allowed if the patient is reliable and if other factors are favorable.

The percentage of patients reported as completing out-patient courses of penicillin in this series compares favorably with other reported studies (2). The following factors may be responsible:

- (a) Patients come every day for 10 days, including Saturday and Sunday. Treatments are given at either 8:30 in the morning or 4:30 in the afternoon. Most patients can arrange their work to meet one of these appointments.
- (b) Prior to prescribing the rapid therapy, the clinician explains in detail the importance of completing the treatment.
- (c) The clinic nurse reminds each patient, on each of his visits, to be present the next day at the same hour.
- (d) The number of patients under treatment at any one time is sufficiently small so that considerable personal attention can be given to each patient.
- (e) Once the patient is started on treatment, he reports directly to the clinic without waiting at the registration desk. This plan allows the patient to receive his treatment without delay.
- (f) If a patient is more than half an hour late for an appointment, the nurse-epidemiologist makes a home visit to try to get the patient in the same day or at least the next day. If a patient misses one day, treatment is continued for an extra day to the full prescribed number of units.

### Summary

1. A method of utilizing penicillin in POB to treat all stages of syphilis, except cardiovascular, in a clinic on a 10-day out-patient basis has been presented.

2. Cost comparisons show that, at present prices of the drug, this method is less expensive to administer than the traditional or the in-patient therapy. Calculations include the cost of drugs and salaries of all personnel, but exclude cost of laboratory work.

3. This method allows a much more efficient use of professional and clerical personnel in the clinic.

4. In this series of 437 patients treated with penicillin in POB, 96.6 percent completed the prescribed therapy as compared with 26.6 percent completing therapy under the traditional schedule, utilizing weekly arsenic and bismuth injections.

5. Treatment reactions occurred in 16 patients, or 3.7 percent of the 437 outpatients; in 5 patients the reactions were

sufficiently severe to justify discontinuing therapy, and in 1 patient with cardiovascular syphilis the reaction was fatal.

6. Rapid treatment in the clinic utilizing penicillin in POB is much more convenient for the patient and is better received than are the other methods discussed.

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2. HAYMAN, C. R.; AIKEN, R. B.: Two Reports on Out-Patient Attendance for Treatment of Syphilis, Using Penicillin in Oil-Beeswax. I. A Study of Clinic Attendance. II. Attendance Record of Patients Treated by Private Physicians. J. Ven. Dis. Inform., 28: 221-225, 1947.

## Cooperation of Gonorrhea Patients in Locating Contacts<sup>1</sup>

Amelia H. Baker, M. A.; M. E. Easterly, M. S.; and Henry Eisenberg, Surgeon (R), United States Public Health Service

In June 1945, penicillin was instituted as routine treatment for gonorrhea in the Chicago Venereal Disease Control Program. Treatment has always been given immediately to a patient with gonorrhea regardless of the number of his reinfections, or whether or not he could or would give contact information to an epidemiologist in the clinic. Often the information given was so inadequate that the field worker could not locate the contacts.

It was decided that an investigation

would be made at one of the venereal disease clinics (the Municipal Consultation Center, located in the Health Department's main building) which would test the practicability of requiring each gonorrhea patient, whether male or female, to bring in his or her principal contact before treatment was given. This study was conducted for three months—May through July, 1947.

The reasons for this experiment were:

1. The expense involved in administering penicillin to persons who were chronic "repeaters" was increasing.
2. A reduction in the epidemiology field staff made it necessary to eliminate field work for all adult gonorrhea contacts.

<sup>1</sup>From the Venereal Disease Control Program of the Chicago Health Department, in cooperation with the United States Public Health Service, under the direction of Herman N. Bundesen, Senior Surgeon (R) (Inactive), United States Public Health Service; President, Chicago Board of Health.



The objectives of the study were:

1. To continue to try to place under treatment as many sources of gonorrhea infections as possible, and thus decrease the spread of the disease.
2. To educate the patient by making him conscious of the need to prevent the spread of the disease through treatment of his contact most likely to be infected, and by making him feel a sense of responsibility in finding and bringing to treatment this contact.

### The Method Employed

After a diagnosis of gonorrhea was made by the clinician, the patient was sent to the epidemiologist for interview. The epidemiologist tried to obtain all pertinent contact information. If the epidemiologist was convinced that the patient could not identify or locate his contact most likely to be infected, the clinic registration card was stamped "Penicillin" and the patient was referred back to the clinician for immediate treatment.

If the interviewer believed that the patient could locate his contact within 24 hours, he was told that it would be necessary that he bring in the contact, and that both would be treated at the same time. Information on other contacts possibly infected was sent to the registry section on an epidemiologic report form (if full name and address could be secured). The registry sent letters to these additional contacts, requesting them to report for examination. Since field investigation of gonorrhea contacts had been eliminated, this plan was in accordance with the revised policy of sending letters.

If the patient reported that after a diligent search he was unsuccessful in locating his contact, he then received treatment.

If a patient failed to return in 24 hours, administrative follow-up (i. e., by letter or phone) was initiated. If he failed to

return in 48 hours, the case was assigned to the field. Only 20 cases were assigned to the field in the 3-month period. Approximately 25 percent of the contact brought in were spouses.

### Results of Study

The following tabulation shows the activity and results of the experiment.

1. Total number of patients diagnosed as having gonorrhea--- 44
2. Number of gonorrhea patients required to bring in contact before treatment----- 24
  - a. Patients who returned with contact and received treatment ----- 143
  - b. Patients who returned for treatment, could not locate contact (no information) ----- 34
  - c. Patients who returned for treatment, could not locate contact but did obtain complete name and address- 32
  - d. Patients who went to private physician for treatment----- 6
  - e. Patients whose contact was already under treatment (verified) ----- 9
  - f. Patients who did not return and were referred for field investigation----- 20
    - Not located----- 6
    - Placed under treatment through field investigation ----14
3. Number of patients treated immediately who were not required to bring in contact---- 19
  - a. Contact unidentified----- 174
  - b. Contact out of the city (full name and address) ----- 25

It will be seen from these figures that following the original interview 244 patients, or 55.1 percent of the total number of 443 patients, were requested to bring in the contact most likely to be infected; and that 143 patients, or 32.3 percent of the 443 patients, were successful in doing so. These 143 patients who were successful comprise 58.6 percent of the 244 patients required to bring in a contact.

In this study, 174 patients, or 39.3 percent of the total patients, stated that their contact was a "pick-up" in the city or out of town and could not be located or identified in any way.

Previous figures for the 6-month period July 1, 1946 to December 31, 1946 show that by field investigation 25.9 percent of the contacts of the total gonorrhea patient load were treated for gonorrhea.

### Comments

Because of a reduction in the epidemiology staff, the present policy in Chicago

in case-finding of contacts of gonorrhea provides for a letter only (when full name and address are available). Many contacts do not respond to a letter.

The results of this study on requiring patients with gonorrhea to bring in a contact before receiving treatment were satisfactory as a public health measure, inasmuch as many cases of gonorrhea were treated which otherwise might not have been found and treated.

In communities where field investigation is not possible or is not considered practicable, this method of requiring case-finding on the part of the patient brings results.

It is only fair to add that there are two drawbacks to this method:

1. An average of two or three interviews instead of one was required for each patient, and this proved quite time-consuming.
2. The patients were often unwilling to delay treatment even for 24 hours, and this factor caused some difficulty.

## CURRENT LITERATURE

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NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of all articles concerned with venereal diseases or related subjects which have been published in the better known journals both here and abroad during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

### ACTA DERMAT.-VENEREOL., STOCKHOLM

Clinical features of over 1,200 syphilitic chancres and chancroids and over 140 cases of lymphopathia venerea. The efficiency of the sanitube. R. D. G. Ph. Simons. 27: 115-122, Fasc. 2, 1946. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 2: 408, Sept. 1947.]

### AM. J. DIGEST. DIS., FORT WAYNE

Army V-D rate hits new low since V-J Day. 14: 14, Oct. 1947.

### AM. J. HYG., LANCASTER

Studies on syphilis in the eastern health district of Baltimore city. IV. Syphilis among parturient women as an index of

the trend of syphilis in the community. George M. Leiby, Thomas B. Turner, E. Gurney Clark, Robert Dyar and Fred C. Kluth. 46: 260-267, Sept. 1947.

\*Cross immunity in experimental syphilis, yaws, and venereal spirochetosis of rabbits. Thomas B. Turner, Charlotte McLeod and Elaine L. Updyke. 46: 287-295, Sept. 1947.

**Cross immunity in experimental syphilis, yaws, and venereal spirochetosis of rabbits.** Thomas B. Turner, Charlotte McLeod and Elaine L. Updyke. *Am. J. Hyg.*, 46: 287-295, 1947.

In a study of the relative cross immunity among three varieties of treponeme (*Treponema pallidum* of syphilis, *Treponema pertenue* of yaws, and *Treponema cuniculi* of venereal spirochetosis in rabbits), three experiments were performed as follows:

1. Eight rabbits were inoculated intratesticularly with the Nichols strain of *T. pallidum*. Six months later these 8 and an uninoculated group of 10 rabbits were inoculated on their backs with a testicular emulsion of *T. cuniculi*, strain A. After 21 days, all control animals had developed cuniculi lesions, but only 2 of the syphilitic animals had developed such lesions, which were small. At 35 days after inoculation, cuniculi lesions were found in one other syphilitic rabbit. Lesions of the control group had enlarged. The authors state that this experiment indicates that a considerable resistance to *T. cuniculi* develops in rabbits within 6 months of infection with *T. pallidum*.

2. Eighty rabbits were apportioned into 4 groups of 20 each. Three groups were inoculated intratesticularly, 1 with strain S-6 of *T. pallidum*, 1 with strain YC of *T. pertenue*, and 1 with strain B of *T. cuniculi*. The fourth group was composed of uninoculated control animals. Six months later, hair was removed from the backs of all rabbits, the bare space was marked off into 4 areas, and these areas were subdivided into 6 sites. The sites in 3 areas were inoculated with treponemes, and the fourth area was used as a control area for infection with normal testicular tissue. Challenge inoculations were made with *T. pallidum*, Nichols strain; *T. pertenu-*

*nuc*, YD strain; and *T. cuniculi*, A strain. After 21 days, control animals had lesions in the 3 areas inoculated with treponemes. The previously infected rabbits, however, showed a significant resistance to each of the 3 species of treponeme used in the challenge inoculations. Details and tables are presented in the article. The authors conclude that infection with any of these varieties of treponeme in time produces greater resistance to the 2 other varieties than is found in the uninoculated control animals.

3. Of 44 rabbits inoculated with *T. cuniculi*, 22 received strain A and 22, strain B. Eighteen uninfected control animals were maintained under the same conditions as the infected ones. Seven months after inoculation, all survivors received intradermal injections of 2 strains of *T. pallidum*, Nichols and C. J., in the same manner as in the second experiment. The authors state that the originally infected animals showed a greater resistance to *T. pallidum* than did the control group.

Since the challenge inoculations probably contained many times the minimal infective dose of the various organisms, the acquired resistance of the experimental animals was subjected to an unusually severe test. The authors recommend further study of the potentialities of *T. cuniculi* as an immunizing agent against infection with *T. pallidum* or *T. pertenue*.

AM. J. TROP. MED., BALTIMORE

"Mal del pinto" or "carate" and its treatment with chlorhydrate or 3-aminodimethoxyarsenbenzen (mapharsen). Gerardo Varela and Carlos Avila. 27: 663-667, Nov. 1947.

AM. PRACTITIONER, PHILADELPHIA

\* Syphilitic cardiovascular disease. Analysis of 59 cases of aortic aneurysm and a review of modern concepts of treatment. Don W. Chapman and R. H. Morgan. 2: 159-166, Nov. 1947.

**Syphilitic cardiovascular disease. Analysis of 59 cases of aortic aneurysm and a review of modern concepts of treatment.** Don W. Chapman and R. H. Morgan. *Am. Practitioner*, 2: 159-166, 1947. The authors report a study of 59



nts with syphilitic aneurysm of the aorta, 15 (25.4 percent) of whom gave history of primary chancre. No history of treatment was obtainable in 40 (67.8 percent) of the patients; treatment was reported as grossly inadequate in 10 (16.9 percent) and only partially adequate in 9 (15.3 percent). The symptoms observed in these 59 patients are presented in tabular form. Positive Wassermann tests were reported in 54 of the patients (91.5 percent). Aneurysms of the aorta predominated in males (78 percent) and in Negroes (72.7 percent). The incidence rate of aneurysm by age groups was highest between 30-60 years of age, with about equal distribution in each of these 3 decades.

Treatment consisted of intramuscular injection of 10,000 units of penicillin followed by 15,000 units and then 50,000 units at 2-hour intervals for a total of approximately 6,000,000 units. In addition, potassium iodide was administered orally each day and bismuth was injected intramuscularly every other day during the course of treatment, which was not even in cases of cardiac failure. The authors state that it is too early to evaluate the results from this type of therapy though some rather good subjective response as far as relief of pain has been seen, but no objective change has been noted in any of the patients. The surgical technic of wrapping the arch of the aorta with polythene cellophane was applied in one patient who was immediately relieved of pain.

The authors state that since syphilitic cardiovascular involvement is one of the preventable forms of heart disease, 90 percent of it could be avoided if syphilis were diagnosed in the primary stage and efficient treatment given. However, once the lesion is established, therapy can only arrest, not alter, the process. No difference was found in the appearance of the lesions in treated and untreated cases. The authors emphasize the value of x-ray examination in locating the aneurysm, judging its size, and discovering possible pressure points resulting from the aneurysm.

#### ANN. INT. MED., LANCASTER

Dissecting aneurysm of the aorta: A review of 17 autopsied cases of acute dissecting aneurysm of the aorta encountered at the Massachusetts General Hospital from 1937 to 1946, inclusive, eight of which were correctly diagnosed ante mortem. Paul David, Edgar M. McPeak, Enrique Vivas-Salas and Paul D. White. 27: 405-419, Sept. 1947.

\*The prognosis of syphilitic aortic insufficiency. George G. Reader, Bruno J. Romeo, Bruce Webster and Walsh McDermott. 27: 584-595, Oct. 1947.

The early development of syphilitic aortitis. Frank S. Houser and Edward M. Kline. 27: 827-829, Nov. 1947.

**The prognosis of syphilitic aortic insufficiency.** George G. Reader, Bruno J. Romeo, Bruce Webster and Walsh McDermott. *Ann. Int. Med.*, 27: 584-595, 1947.

In discussing the general belief that the course of syphilitic aortic insufficiency is rapidly progressive, the authors present a report based on a study of 43 patients with syphilitic aortic insufficiency intensively treated with bismuth and trivalent arsenicals and followed from 2 to 16 years. In 27 of these patients, determinations of cardiac efficiency made in 1941 and 1946 showed that during that 5½-year period, 20 of the 43 changed to worse, although in only 6 of 18 asymptomatic patients did symptoms develop. Thirteen of the 43 died, 8 of heart disease. Twenty-seven living patients are at present able to continue their pursuits; 12 still remain completely asymptomatic.

In conclusion, the authors state that: (1) Syphilitic aortic insufficiency may be characterized by an asymptomatic phase of at least 2 to 10 years; (2) a symptomatic phase usually occurs which may last from 2 to 14 years; (3) cardiac failure in this disease may be as readily controlled with digitalis and mercurial diuretics as cardiac failure in other types of heart disease; and (4) prolonged circulation time and low diastolic blood pressure offer the best indices for prognosis.

#### ANN. SOC. BELGE DE MÉD. TROP., BRUXELLES

Nouvelle enquête sur les séroréactions de Bordet-Wassermann et de Kahn dans la malaria. (A new study of Wassermann and Kahn reactions in malaria.) M.

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HELVET. PAEDIAT. ACTA, BASEL

Children with juvenile dementia paralytica and nonsyphilitic siblings: report of two cases. Hans Zellweger. 1: 341, Mar. 1946. [Abstracted in Am. J. Dis. Child, Chicago, 74: 524, Oct. 1947.]

J. A. M. A., CHICAGO

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\*Granuloma inguinale of the vagina at cervix uteri with bone metastases. Henry Packer, Henry B. Turner and A. D. Dulaney. Clinical Notes, Suggestions and New Instruments. 136: 327-329, Jan. 31, 1948.

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**Granuloma inguinale of the vagina at cervix uteri with bone metastases.** Henry Packer, Henry B. Turner and A. D. Dulaney. Clinical Notes, Suggestions and New Instruments. J. A. M. A., 136: 327-329, 1948.

In illustration of the capacity for widespread systemic invasion inherent in granuloma inguinale of the cervix uteri the authors present a case of this disease with bone metastases and abscesses in distant parts of the body.

The patient, a 19-year-old Negro woman admitted to the hospital following an abortion, recovered with sulfadiazine therapy and was discharged on the ninth

7. During the next 7 months, however, the patient was unable to work because of pain in the hip, severe discomfort in the abdomen and back, and a 60-pound weight loss. An examination in the outpatient department in July revealed a body induration of the vaginal vault with no involvement of the cervix.

On a second admission to the hospital in October, following increased pain in the abdomen and a bloody vaginal discharge, there was observed a tender, nodular, friable infiltration of the cervix and vaginal walls. Pelvic examination produced excruciating pain. A perirectal abscess developed soon after admission, followed by fluctuating pain in the right knee and left hand, at which sites large abscesses formed under the skin. Roentgenologic examination of these areas revealed regions of bone destruction under each swelling. A cystoscopic examination revealed a granulomatous lesion of the bladder, the impression being that of an extensive malignant growth, originating in the cervix uteri and spreading to involve the bladder. Biopsies of the cervix showed numerous large macrophages, and Donovan bodies were revealed in the hematoxylin and eosin preparations as well as in particles of granulation tissue stained by Wright's technic. The patient responded well to intravenous injections of antimony potassium tartrate, administered initially in a dose of 3 cc. of a 1-percent solution, which dosage was repeated subsequently every other day with an increase of 1 cc. each time until a level of 8 cc. was reached. Within 3 weeks, a 20-pound gain in weight was made and the granulation tissue in the vagina had become firm in consistency. Forty days after the beginning of treatment, encapsulated Donovan bodies no longer could be observed in the granulation tissue, and the patient was discharged from the hospital with advice to continue treatment as an out-patient.

The systemic manifestations which occurred in this patient after an abortion emphasizes the hazard of pregnancy for women with untreated granuloma in-

guinale of the cervix and stresses the importance of a high index of suspicion of granuloma inguinale in cervical lesions in pregnant women.

The authors recommend the use of Wright's stain on smears from the surface of lesions or from particles of granulation tissue as a rapid and simple process which might well become routine in population groups in which granuloma inguinale is known to occur.

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A method for determining the size and relative weight of penicillin particles and its importance in preparing adequate preparations of liquid penicillin in oil and wax. Velma L. Chandler, Monroe J. Romansky, Henry Welch, Jay A. Robinson, William W. Zeller, Harry F. Dowling and Harold L. Hirsh. 37: 21-23, Jan. 1948.

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\*The treatment of early syphilis with penicillin at Bellevue Hospital. Evan V. Thomas. 47: 2439-2442, Nov. 15, 1947.  
\*Treatment of late acquired syphilitic other than neurosyphilis. James W. Jordan and Frank A. Dolce. 47: 2443-2446, Nov. 15, 1947.  
\*Treatment of neurosyphilis. Bernha Dattner. 47: 2447-2449, Nov. 15, 1947.  
\*The serologic tests in penicillin-treated syphilis. Charles R. Rein. 47: 2450-2452, Nov. 15, 1947.  
Education for prevention chief goal of venereal disease fund drive. Medical News. 47: 2464, Nov. 15, 1947.
- The treatment of early syphilis with penicillin at Bellevue Hospital.** Evan V. Thomas. New York State J. Med., 47: 2439-2442, 1947.
- The author presents a report on results of treatment in nine series of patients with early syphilis, using penicillin alone or penicillin in combination with arsenic oxide and/or bismuth. All of the nine treatment schedules were assigned by the

Subcommittees for Venereal Diseases of the National Research Council or the National Institute of Health.

A table is presented which gives the plan of treatment in each of the nine series of patients, the number of patients treated in each group, the number of patients followed up, and the results of treatment up to Mar. 31, 1947. Data presented in the table indicate that the treatment of early syphilis with 1,200,000 units of commercial penicillin in 8 days is grossly inadequate. Daily injections of 0.4 gm. of arsenoxide for 8 days added to 1,200,000 units of penicillin gave unsatisfactory results in 30 percent of patients treated.

The use of 2,400,000 units of penicillin in 7½ days yielded good results. One schedule combining 0.32 gm. of arsenoxide and 0.6 gm. of metallic bismuth with 400,000 units of penicillin yielded satisfactory results in 90.1 percent of patients treated. Nevertheless, it is doubtful whether the addition of arsenoxide and bismuth is necessary, because the series receiving 2,400,000 units of penicillin alone have had just as good results for a 6 months' follow-up period. Satisfactory results were obtained in 58 (98.2 percent) of 59 patients followed 6 months or more who were treated with 26,666 units of penicillin G every 2 hours to a total of 4,800,000 units. Of 74 patients given 3,333 units of penicillin G every 2 hours to a total of 4,800,000 units, satisfactory results were obtained in 72 (97.3 percent). The author believes that most of the so-called failures in these latter groups were probably reinfections, and he presents case reports of 6 patients as typical examples to substantiate his assumption. The data presented favor injections of penicillin G every 2 hours for 90 doses rather than every 3 hours for 60 doses, but indicate that nothing is gained by giving more than 2,400,000 units of penicillin G, provided individual doses are given every 2 or 3 hours.

A group of 802 patients was given 4,800,000 units of calcium penicillin in beeswax and peanut oil administered in daily injections of 600,000 units for 8 days. Of

529 of these patients followed 9 months or more, satisfactory results were obtained in 450 (85.1 percent). The author believes that half the failures in this group were probably due to reinfections. The results obtained not only justify the use of penicillin in beeswax and oil for the treatment of early syphilis but also make it desirable for the treatment of patients who will report regularly on an ambulatory basis.

Although a number of patients were treated four times, the author found no evidence that anyone in the group was penicillin resistant. So far he has found no patient treated for early syphilis whose positive spinal fluid findings failed to become normal after one or more courses of penicillin.

**Treatment of late acquired syphilis other than neurosyphilis.** James W. Jordan and Frank A. Dolce. New York State J. Med., 47: 2443-2446, 1947.

The authors review the literature on the treatment of late acquired syphilis other than neurosyphilis. They believe that optimum treatment of latent syphilis consists of 20 to 29 injections of an arsenical compound and about 40 injections of a bismuth compound, and that benign late syphilis should receive the same treatment. At this time they do not recommend penicillin alone in the treatment of late benign syphilis.

Data were gathered on 177 cases of cardiovascular syphilis to determine how many had received adequate treatment, either during the early stages of their syphilis or during the latent period, and to determine the effect of treatment on well-advanced cases of syphilitic aortitis. Of 64 patients with syphilitic aortitis, only 4 gave a history of having had 40 or more injections of an antisiphilitic drug during the early or latent phase of the disease. Eleven had sporadic treatment, the average amount being 4 injections of an arsenical drug and 4 injections of a heavy metal. The other 49 patients had received no treatment during the early or latent stages of the disease. Of these 64 patients, 56 were observed for an average

of 5.4 years. During this period, 16 of them progressed from simple syphilitic aortitis to either aortic insufficiency or aneurysm. The average amount of treatment these 16 patients received during the period when they had frank syphilitic aortitis was 7.7 injections of a heavy metal and 1 injection of an arsenical drug. The other 48 patients still had syphilitic aortitis at the time of the last examination. Most of these were under antisyphilitic treatment for much of the period of observation.

Of 113 patients who had aortic insufficiency, sacular aneurysm, or both, only 3 gave a history of having had 40 or more injections of an antisyphilitic drug. Twenty others had some previous antisyphilitic treatment, the average amount being 4.5 injections of an arsenical drug and 7.8 injections of a heavy metal. These patients were observed for an average of about 2.9 years. Several were observed for 10 years or more. The authors were unable to determine definitely what effect, if any, specific antisyphilitic treatment had upon prolonging the life of these patients; however, they feel that treatment of uncomplicated syphilitic aortitis may often prevent development of serious cardiovascular complications. They feel that simple syphilitic aortitis should be treated steadily with proper bismuth and arsenical therapy for at least 2 years, followed by 1 course of treatment yearly for a total of 5 years. Once aortic insufficiency or aneurysm has developed, specific antisyphilitic treatment must be used cautiously.

From their study, the authors found late syphilitic cardiac disease to be most common in the Negro male, next most common in the white male, and least common in the white female.

**Treatment of neurosyphilis.** Bernhard Dattner. *New York State J. Med.*, 47: 2447-2449, 1947.

The author discusses the importance of the spinal fluid findings as the only reliable criteria for the success or failure of treatment of neurosyphilis, provided the spinal fluid examination comprises the cell

count, total protein determination, colloidal gold and complement fixation test and provided all the tests are considered as a whole. Much confusion has arisen however, because of discrepancies between the rapid drop to normal of the cell count in successfully treated patients and the gradual decline or fluctuating values obtained in the other tests. With the aid of new quantitative complement fixation tests and quantitative colloidal gold test however, it becomes apparent that there is a strict parallelism between the activity of the process and all the spinal fluid tests. Two case histories are presented as illustrations.

A report is presented of 250 patients with neurosyphilis treated with aqueous penicillin administered intramuscularly in dosages varying from 30,000 to 40,000 units every 3 hours to a total dosage from 2,000,000 to 9,000,000 units.

Of the 250 patients treated, 193 have been followed for more than 6 months; 100 being followed for two or more years. Of the 193 patients followed for more than 6 months, 165 (85 percent) now have an inactive spinal fluid. This compares favorably with figures given previously for a similar group of patients treated with combined malaria and chemotherapy.

Detailed statistical data on the results of treatment are presented in three tables.

**The serologic tests in penicillin-treated syphilis.** Charles R. Rein. *New York State J. Med.*, 47: 2450-2452, 1947.

The author discusses the importance of quantitative serologic examinations in the follow-up of penicillin-treated syphilis as a guide in response to treatment, as a means of differentiating between serologic relapse and reinfection, as an aid in predicting an impending clinical relapse and as a means of detecting masked syphilis following a concomitantly treated gonorrheal infection.

Various factors which influence the length of time required to attain seronegativity include: (1) stage of disease; (2) immunologic response of individual patients; (3) degree of serologic titer.



) sensitivity of the serologic procedure; (5) type of test employed; and (6) treatment schedule employed. These are considered in detail.

From observations made at the Army Medical School, the author feels that it is possible to distinguish between relapse and reinfection by carefully conducted quantitative serologic studies at frequent intervals. There is usually a progressive decline in serologic titer following penicillin therapy in patients with early syphilis. The author observed that, in infection, the patient usually attained and maintained complete seronegativity followed by the development of a dark-field positive, seronegative lesion at a new site. Shortly thereafter, such patients developed seropositive reactions with rapidly increasing titers. In relapses, however, there was noted a sudden increase in serologic titer followed in about 1 month by clinical evidence of a mucocutaneous relapse in the majority of instances. In the author's opinion, if serologic examinations of penicillin-treated patients were performed at weekly or monthly intervals, it might be possible to predict a clinical relapse about 1 month before the appearance of clinical manifestations, through a progressive increase in serologic titer on repeated examinations. He stresses the necessity of educating patients to return for serologic and clinical examinations at regular monthly intervals for at least 1 year following completion of penicillin treatment.

Penicillin therapy for gonorrhea may abort, mask, or delay a concomitantly acquired syphilitic infection. The value of the quantitative serologic test in detecting such syphilitic infections prior to, during, or after penicillin treatment for gonorrhea is discussed.

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## CURRENT NOTES AND REPORTS

### Penicillin Treatment Chart

In this issue of the JOURNAL OF VENEREAL DISEASE INFORMATION, the reader will find a copy of the current chart on "Examples of Acceptable Penicillin Schedules." This chart has been widely distributed by the Venereal Disease Division during the past 2 months to Public

Health Service district offices, State health officers, and other interested groups. Copies of the chart and reprints of the report on which it is based may be obtained in quantity through the Venereal Disease Division, United States Public Health Service, Washington 25, D. C.

# EXAMPLES OF ACCEPTABLE PENICILLIN SCHEDULES

SYPHILIS	Drug	Dose per Injection	Number of Injections Each Day							Total Injections (Dose x 7)
			1st	2nd	3rd	4th	5th	6th	7th	
Primary										
Secondary										
Latent	Penicillin G Aqueous	30,000 units (intramuscular) Every 2 Hours	12	12	12	12	12	12	12	84 (24 million units)
Late Manifest										
Late Congenital										
Pregnant Women										
Primary										
Secondary	Penicillin G In 40 and 80 cc Burets	600,000 units (intramuscular) Every 24 Hours	3	1	1	1	1	1	1	10 (15 million units)
Latent										
Late Manifest										
Late Congenital										
Early Congenital	Penicillin G Aqueous	170,000 units per 10 cc of 10% solution every 2 hours intramuscularly	12	12	12	12	12	12	12	12 (180,000 units per 10 cc dose every 2 hours)
	<p><b>Neurosyphilis</b></p> <p><b>Syphilis</b> Acute Meningitis Chronic Meningoencephalitis Cerebral Syphilis Tabes</p> <p>Penicillin G 10-20 million units penicillin administered over 10-20 days accompanied by fever therapy unless contraindicated</p>									
	<p>Holding is done as to the effectiveness of penicillin in cerebrospinal syphilis. If penicillin is utilized, it should be started after the patient is treated for several weeks with therapy having the most penicillin dosage shown to be safe (6 or more million units, individual cases established) and duration of treatment prolonged 15 to 20 days.</p>									
Cardiovascular										
Syphilis										
	Penicillin G in 40 cc Burets	30,000 units intramuscular								
	Penicillin G Burets	30,000 units in 10 cc of 10% solution every 2 hours								
	Penicillin G Burets	30,000 units in 10 cc of 10% solution every 2 hours								



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## Handbook for Physicians

A new, up-to-date adaptation of the booklet *Syphilis Today*, first issued by the Mississippi State Board of Health in 1947, will shortly be made available to the practicing physician. The new edition will be entitled *Diagnosis and Treatment of Syphilis: A Handbook for Physicians*, and will carry concise, conveniently arranged information on all phases of syphilis. The format will be attractive and will be designed for easy reference on currently

acceptable diagnostic, laboratory, and rapid treatment techniques.

The handbook will be published by the Venereal Disease Education Institute, Raleigh, N. C., in cooperation with the Venereal Disease Division of the United States Public Health Service. It will be ready for distribution early this summer. A later issue of the JOURNAL will provide additional information as to price and placing of orders.

## International Reports

The *Journal of Social Hygiene*, published by the American Social Hygiene Association, recently carried two important reports dealing with world health. The February 1948 issue was designated the International Number, and carries an article by Dr. Thorstein Guthe, Dr. John C. Hume, and collaborating authors on "International Aspects of the Venereal Disease Problem." The report deals with epidemiologic considerations, venereal disease in relation to total environment, and international contributions to control; presents tables and charts on international incidence of syphilis; lists past international agreements,

recommendations, and decisions; and presents a general discussion and recommendations for the future. The report is comprehensive and historical, and should be of interest to those persons who have followed the progress of the World Health Organization.

In the March 1948 issue of the *Journal of Social Hygiene* are "Excerpts from a Summary Report: Proceedings of the First Postwar General Assembly, International Union against the Venereal Diseases" (Paris, France, October 20-25, 1947). The full text of the Summary Report is available.

## Chicago Exhibit for Beauty-Shop Operators

For the recent national meeting of negro beauty-shop operators in Chicago from February 29 to March 3, 1948, Chicago's Venereal Disease Control Program created a special exhibit featuring the signs of syphilis as they appear on the face, the neck, and the scalp. The exhibit was aimed at stimulating cooperation among members of the beauty profession in the detection of early cases of

syphilis and in referring such cases to proper medical care.

The exhibit was viewed by more than 2,000 persons from all sections of the country attending the second annual convention of the United Beauty-School Owners and Teachers Association. Kits of informational literature were placed in the hands of each member, and during the four-day period the film "Message to Women" was shown twice.

# STATISTICS

## Reasons for Coming to Venereal Disease Clinics:



secondary syphilis (July 1946 to December 1947)

Patients with previously untreated primary or

Category and Period <sup>a</sup>	Reason for coming to venereal disease clinics for diagnosis														
	Patient's initiative					Contact investigation	Pre-natal	Pre-marital	Police or court case	Health card application	Selectee or separate examination	Other	Total <sup>b</sup>		
	Total	Mentioned symptoms	Symptoms not mentioned	No data on symptoms	Percent										
Percent	65.5	60.9	4.6	0	Percent	24.3	1.6	0.7	2.1	Percent	1.3	0.1	Percent	100.0	1,492
(1) July-September 1946	65.1	49.0	4.8	11.3	22.4	1.3	0.7	3.4	3.4	2.1	0.1	0.1	4.9	100.0	3,440
(2) October-December 1946	63.0	39.4	3.8	19.8	25.3	1.4	0.6	3.6	3.6	2.1	0.4	0.4	3.6	100.0	4,133
(3) January-March 1947	62.9	39.9	3.7	19.3	25.5	1.7	0.3	3.0	3.0	2.1	0.3	0.3	4.2	100.0	4,025
(4) April-June 1947	64.8	40.6	2.7	21.5	23.1	1.4	0.7	2.8	2.8	1.6	0.1	0.1	5.5	100.0	4,558
(5) July-September 1947															

Percent of previously untreated PRIMARY AND SECONDARY SYPHILIS cases by reason for coming to diagnosis

(1) July-September 1946

(2) October-December 1946

(3) January-March 1947

(4) April-June 1947

(5) July-September 1947



Percent of previously untreated, TOTAL VENE-  
REAL DISEASE infections by reason for coming  
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<sup>a</sup> The following areas are included in all periods: Arkansas, Chicago, Iowa, Kansas, Michigan, Nebraska, Oklahoma, South Carolina, West Virginia. The following areas are included only in the periods indicated: Colorado—2, 4, 5, 6; District of Columbia—4, 5, 6; Illinois (down-State)—1, 2; Kentucky—3, 4, 5, 6; Louisiana—3, 4, 5, 6; New Mexico—4, 5, 6; New York City—4, 5, 6; Ohio—2, 3, 4, 5, 6; St. Louis—2, 3; Texas—2, 3, 4, 5, 6.

<sup>b</sup> Cases reported as "Transferred In" have been omitted.

<sup>c</sup> This percentage is based on the number of venereal disease infections diagnosed and the number of persons found not infected.

<sup>d</sup> Texas data reported as "other."

<sup>e</sup> These percentages are higher than for "premarital," probably because of the screening effect in some areas of Maternal and Child Welfare clinics which refer only women with positive blood tests to a venereal disease clinic.

Source: Optional supplement to USPHS—Form 8954-A. USPHS—Venereal Disease Division, Office of Statistics 4/13/48 (FFD-GRT) grt.





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Volume 29

July 1948

Number 7

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FEDERAL SECURITY AGENCY  
PUBLIC HEALTH SERVICE



**FEDERAL SECURITY AGENCY**

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**PUBLIC HEALTH SERVICE**

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**Approved by the Director, Bureau of the Budget, as required by  
Rule 42 of the Joint Committee on Printing**



UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.  
Price 10 cents. Subscription price: Domestic, 75 cents a year; foreign \$1.15

# Syphilis Mortality Analysis 1933-45<sup>1</sup>

Gold A. Kahn, Biostatistician, and Albert P. Iskrent, Principal Statistician, United States Public Health Service

This paper presents data on trends in reported syphilis death rate for the United States as a whole and for individual States, and attempts to evaluate trends in terms of their validity and significance. The analysis begins with 1933, which was the first year in which the entire United States was included in the vital statistics registration area. The data upon which this study is based are tabulations of death certificates by the National Office of Vital Statistics, estimates of population by the Bureau of Census, syphilis prevalence rates by the Venereal Disease Division based on examination of two million selectees, and syphilis morbidity data reported by States to the United States Public Health Service.

Table 1 presents data on reported syphilis mortality in the continental United States for the years 1933 through 1945. Partial data for the year 1946 are also included. Perhaps the most outstanding trend in this table is the decrease in the total syphilis death rate beginning in 1937 and continuing through 1946. In 1938, reported deaths from syphilis constituted slightly over 1 percent of total deaths for white persons and over 4 percent of all deaths for nonwhite. By 1945, 1.5 percent of white deaths and 3.1 percent of nonwhite deaths were reported as caused by syphilis. Although it is evident that the reported syphilis mortality rate has consistently and substantially declined since 1938, it is important to emphasize that syphilis remains a major cause of death, particularly in the Negro population. Only eight categories excluded syphilis as a reported cause of death for Negroes in 1945: heart disease, racial lesions of vascular origin, phthisis, tuberculosis, pneumonia, cancer,

accidents, and diseases of early infancy—in that order.

In any analysis of mortality trend, it is extremely important to differentiate between trends due to changes in reporting and those which represent fundamental changes in death rates. It seems probable that during this 13-year period physicians have become more able and more willing to report syphilis as a cause of death rather than less able and less willing to do so. Thus, the downward trend in syphilis death rates in the past 9 years is considered to be indicative of real decreases rather than of poorer reporting. In addition to possible improvements in reporting, the following factors may be considered as exerting upward forces on the syphilis mortality trend:

1. In the period 1930 to 1945, lengthening of the average life expectancy of white persons from approximately 61 to 67 years and of nonwhite persons from approximately 49 to 58 years. Death from syphilis usually occurs at about ages 40 to 60, and the greater the proportion of persons attaining such ages the higher is the probability of death from syphilis to which they are exposed.
2. Changes in the *Manual of the International List of Causes of Death*. The 1938 revision of this list designated aneurysm of the aorta as a syphilitic category for the first time. Prior to 1939, aneurysm did not have much weight in the *Manual of Joint Causes of Death*, and the majority of such deaths were assigned to associated or contributory causes reported with the aneurysms. The 1939 aneurysm rate increased 50 percent over the 1938 rate. However, it has declined since then, so that

<sup>1</sup>From the Venereal Disease Division.

Table 1.—Summary of reported syphilis mortality, United States, 1933-45

Year	Number of syphilis deaths			Syphilis death rate (per 100,000 population)			Percent due to syphilis of total deaths from all causes			Syphilis death rate per 100,000 population by detailed cause															
	Total	White	Non-white	Total	White	Non-white	Locomotor ataxia				Paresis			Aneurysm <sup>1</sup>			Other forms								
							Total	White	Non-white	Total	White	Non-white	Total	White	Non-white	Total	White	Non-white	Total	White	Non-white				
1933.....	18,984	12,298	6,686	15.1	10.9	52.4	1.41	1.06	3.72	0.9	0.9	0.9	3.6	3.1	8.2	1.8	1.6	4.0	8.8	5.3	39.3	8.8	5.3	42.1	8.8
1934.....	20,075	12,801	7,274	15.9	11.3	56.6	1.44	1.06	3.83	.9	.9	.7	3.8	3.2	9.5	1.9	1.6	4.2	9.3	5.6	40.8	9.3	5.6	40.8	9.3
1935.....	19,560	12,554	7,006	15.4	11.0	54.0	1.40	1.04	3.78	.7	.7	.7	3.6	3.0	8.6	1.9	1.7	4.1	9.1	5.5	43.4	9.1	5.5	43.4	9.1
1936.....	20,701	13,279	7,422	16.2	11.5	56.8	1.40	1.04	3.70	.8	.8	.8	3.5	2.9	8.3	2.1	1.8	4.3	9.8	6.0	43.4	10.3	6.3	45.1	10.3
1937.....	20,802	13,179	7,623	16.1	11.4	58.0	1.43	1.05	3.90	.7	.7	.6	3.2	2.6	8.4	2.0	1.7	3.9	10.3	6.3	44.0	10.3	6.3	44.0	10.3
1938.....	20,645	12,928	7,717	15.9	11.1	58.2	1.49	1.08	4.15	.6	.6	.7	3.5	2.8	9.7	2.0	1.8	3.8	9.8	5.9	44.0	9.8	5.9	44.0	9.8
1939.....	19,604	12,233	7,371	15.0	10.4	55.1	1.41	1.01	4.08	.6	.6	.5	3.4	2.6	8.9	2.0	2.4	8.2	7.9	4.6	37.0	7.9	4.6	37.0	7.9
1940.....	19,006	11,701	7,305	14.4	9.9	54.3	1.34	.95	3.93	.5	.5	.5	3.2	2.5	9.1	2.6	2.0	7.5	7.0	4.2	30.4	7.0	4.2	30.4	7.0
1941.....	17,728	11,128	6,600	13.3	9.3	47.5	1.27	.92	3.58	.5	.5	.4	3.4	2.5	10.5	2.3	1.8	6.4	6.0	3.8	25.0	6.0	3.8	25.0	6.0
1942.....	16,345	10,370	5,975	12.2	8.6	42.5	1.18	.86	3.41	.4	.4	.5	3.5	2.6	11.5	2.2	1.8	6.1	5.9	3.8	24.0	5.9	3.8	24.0	5.9
1943.....	16,263	10,365	5,898	12.1	8.6	42.1	1.11	.81	3.30	.4	.4	.5	3.5	2.6	11.3	2.1	1.7	6.0	5.2	3.3	21.8	5.2	3.3	21.8	5.2
1944.....	14,916	9,415	5,501	11.3	7.9	39.6	1.06	.76	3.19	.4	.4	.4	3.3	2.4	11.1	2.2	1.8	5.7	4.8	3.0	19.7	4.8	3.0	19.7	4.8
1945.....	14,062	8,892	5,170	10.7	7.5	36.9	1.00	.72	3.08	.4	.4	.5	3.3	2.4	11.1	2.2	1.8	5.7	4.8	3.0	19.7	4.8	3.0	19.7	4.8
1946.....	12,955	9.3	---	9.3	---	---	.93	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

<sup>1</sup> Aneurysm of the aorta designated as syphilitic beginning in 1939. Prior to this date, aneurysm had little weight in the *Manual of Joint Causes of Death* and was frequently tabulated under associated causes.

Source: Bureau of the Census: Vital Statistics Rates in the United States, 1900-40; Mortality Statistics, 1933-36; Vital Statistics of the United States, 1937-45; Population Releases. U. S. Public Health Service, National Office of Vital Statistics: Vital Statistics Special Reports, vol. 26, No. 1; Current Mortality Analysis, vol. 4, No. 13.



the 1945 rate is only 10 percent over the 1938 rate.

In spite of the upward effect of these factors, the total reported syphilis death rate has decreased since 1938.

The data in table 1 for detailed causes of syphilis death show downward trends since 1939 for each category except paresis. The trend in the paresis death rate for the nonwhite population is contrary to the over-all trend in rates of admission to mental hospitals for paresis, which decreased 18 percent from 1938 to 1945. The proportion that paresis is of all psychoses admitted to mental hospitals has similarly decreased 32 percent in this period. However, these mental hospital admission rates are not available by color.

For the most recent year of complete data (1944), table 2 presents age-adjusted syphilis death rates by color, sex, and category of syphilis. The purpose of age adjustment is, of course, to increase the comparability of rates for various sex and color groups. Any rate differences among these groups caused by different distribution within the groups are removed by the adjustment process. Several of the ratios contained in this table are outlined below:

- (a) In each instance (except male deaths from locomotor ataxia) the nonwhite rate is at least 4 times the white rate.
- (b) Among white persons, the rates for males are about 3 times the rates for females.
- (c) Among nonwhite persons, the rates for males are about 2.5 times the rates for females.

It is interesting to note that these relationships are quite different from those reported case rates. For example, reported case rates are approximately equal for males and females (1.3 to 1) although the death rate for males is much higher than for females. The reported case rate for nonwhite is 14 times the rate for white persons although comparison of age-adjusted reported death rates shows nonwhite rates to be 6 times the white rate. These comparisons would suggest that

among a group of syphilitics the risk of dying from syphilis varies substantially by color and sex.<sup>2</sup> Table 3 presents a

**Table 2.—Age-adjusted<sup>1</sup> syphilis mortality rates per 100,000 population by color, sex, and category of disease, United States, 1944**

Color and sex	Total syphilis	Locomotor ataxia	Paresis	Aneurysm of aorta	Other
Total.....	10.6	0.4	3.3	2.0	4.9
Male.....	15.8	.6	5.2	3.2	6.8
Female.....	5.6	.2	1.4	.8	3.2
White.....	7.3	.4	2.4	1.5	3.0
Male.....	11.1	.6	3.8	2.5	4.2
Female.....	3.6	.1	1.1	.6	1.8
Non white.....	44.3	.6	13.0	7.0	23.7
Male.....	63.7	.8	20.4	10.9	31.6
Female.....	25.4	.4	5.8	3.3	15.9

RATIO OF NONWHITE RATE TO WHITE RATE

Total.....	6.1	1.5	5.4	4.7	7.9
Male.....	5.7	<sup>2</sup> 1.3	5.4	4.4	7.5
Female.....	7.1	4.0	5.3	5.5	8.8

RATIO OF MALE RATE TO FEMALE RATE

Total.....	2.8	3.0	3.6	4.0	2.1
White.....	3.1	6.0	3.6	4.2	2.3
Nonwhite.....	2.5	2.0	3.5	3.3	2.0

<sup>1</sup> Standard population used for adjustment was the total U. S. population in 5-year age-groups—Sixteenth Census April 1, 1940.

<sup>2</sup> This category presents the curious situation of approximately equal rates for white and nonwhite, which is a rare occurrence in the United States for either syphilis incidence, prevalence, or mortality.

Source: Syphilis deaths—Vital Statistics of the United States, 1944. Populations—Population Series P-47 No. 3 and 16th Census. Rates 1944—Age-specific rates and age-adjusted rates computed by Venereal Disease Division, U. S. Public Health Service.

relative index of risk from syphilis mortality for reported syphilis cases. This index shows that the mortality risk may be higher for white than nonwhite and higher for males than females.

The median ages of reported syphilis deaths, 1933-44, are shown in table 4. Although the median age of syphilis deaths has increased from 48.2 to 52.9 years dur-

<sup>2</sup> Factors related to the course of syphilis have been frequently cited in the literature. Stokes (1) mentions age, sex, race, pregnancy, intercurrent infection, and mental activity, among others. Turner (2) noted cardiovascular syphilis to be more frequent among males than among females and also more frequent among nonwhite than among white persons.

Table 3.—*Relationship of reported syphilis case rates and reported syphilis death rates, continental United States*

Color and sex	Re-ported case rate per 100,000 (1943-47)	Re-ported death rate per 100,000 (1944)	Ratio of death rate to case rate	
			Actual	Index (total=100)
Total-----	321.4	11.3	0.035	100.0
Male-----	367.3	17.2	.047	134.3
Female-----	280.4	5.8	.021	60.0
White-----	136.4	7.9	.058	165.7
Male-----	168.6	12.4	.074	211.4
Female-----	107.7	3.8	.035	100.0
Nonwhite-----	1,884.1	39.6	.021	60.0
Male-----	2,048.6	57.8	.028	80.0
Female-----	1,737.6	23.0	.013	37.1

Source: Reported deaths from Vital Statistics of the United States, 1944; reported cases from U. S. Public Health Service Form 8958-B; population estimates from Bureau of the Census.

1933 white persons in the United States lost 290,303 years of life because of syphilis infection, and by 1944 the loss was reduced by 89,109 years. Complete data were not available to make a similar computation for nonwhite persons.

A measurement of this type combines the value to the public welfare of preventing persons from dying of syphilis and the value of extending the year of life for other persons who will die of syphilis when the disease progression can no longer be halted. The percentage increase of years lost from 1933 to 1944 is slightly greater than the percentage increase in syphilis death rates for the same years.

Table 5 shows that the age group 45-54 had the largest reduction in years of life

Table 4.—*Median age of reported syphilis deaths, United States, 1933-45*

Year	All syphilis					Paresis	Loco- motor ataxia	Aneu- rysm <sup>1</sup>	Oth
	Total	White		Nonwhite					
		Male	Female	Male	Female				
1933-----	48.2	52.8	49.0	43.2	36.5	48.6	60.6	57.4	
1934-----	48.5	53.2	49.4	43.8	36.1	49.2	61.3	57.4	
1935-----	48.7	53.2	49.0	43.9	36.9	49.3	61.0	57.1	
1936-----	49.6	53.9	50.5	44.8	36.5	50.1	61.4	58.1	
1937-----	49.8	54.6	50.4	44.4	37.0	49.6	61.2	59.6	
1938-----	50.2	55.0	51.6	44.9	37.7	50.4	61.5	59.3	
1939-----	50.5	55.7	51.5	45.0	37.5	50.5	62.4	56.4	
1940-----	51.5	55.9	51.8	46.0	39.1	51.1	62.6	55.8	
1941-----	52.0	56.7	52.2	46.5	39.3	51.4	62.3	56.4	
1942-----	52.3	56.8	53.1	46.7	40.7	51.2	62.7	56.8	
1943-----	52.9	56.8	53.7	47.9	41.6	51.4	63.0	57.4	
1944-----	52.9	57.2	54.4	47.8	42.0	51.6	62.4	58.0	

<sup>1</sup> Aneurysm of the aorta designated as syphilitic beginning in 1939. Prior to this date, aneurysm had little weight in the *Manual of Joint Causes of Death* and was frequently tabulated under associated causes.

Source: Mortality Statistics of the United States, 1933-36; Vital Statistics of the United States (by place of occurrence), 1937-44.

During this period, it should be realized that this is associated with an increase from 58.2 to 63.6 years in the median age at death from all causes.

In order to combine the effect of the lowered syphilis death rate and the increased age at death, a computation<sup>3</sup> was made for the years 1933 and 1944, among white persons, of the annual loss of life in years attributed to syphilis (table 5). This calculation indicates that in

<sup>3</sup> Years of life lost due to syphilis in year A =  $\sum_{x=0}^{100} m_x$

where  $\sum_{x=0}^{100}$  = Sum of ages 0 to 100  
 $m_x$  = Number of syphilis deaths in year A at age X  
 $e^0_x$  = Expectation of life in year A at the beginning of middle year in age interval X

Summations were made in 5-year age intervals, except 0 to 4 years) using  $e^0_x$  data from the life table nearest to year A (1930  $e^0_x$  with 1933 mortality data; 1945  $e^0_x$  with 1944 deaths).

Table 5.—Years of life lost due to syphilis—United States white population, 1933 and 1944

Age	1933		1944		Reduction of years of life lost (1933-44)
	Number of deaths	Years of life lost (based on 1930 life table)	Number of deaths	Years of life lost (based on 1945 life table)	
Infant	796	48,356	287	19,172	29,184
1-4	58	3,686	11	761	2,925
5-9	11	692	3	200	492
10-14	9	558	2	126	432
15-19	10	612	1	66	546
20-24	30	1,764	12	756	1,008
25-29	35	1,912	22	1,292	620
30-34	75	3,745	52	2,752	993
35-39	155	7,051	87	4,241	2,810
40-44	249	10,293	129	5,658	4,635
45-49	508	18,612	275	10,918	7,694
50-54	845	27,506	501	17,161	10,345
55-59	1,132	32,292	738	22,250	10,042
60-64	1,476	36,012	974	24,965	11,047
65-69	1,600	32,712	1,151	24,840	7,872
70-74	1,485	25,564	1,396	24,539	1,025
75-79	1,316	18,689	1,303	18,714	-25
80-84	1,019	11,420	1,099	12,567	-1,147
85-89	681	5,634	690	6,389	-755
90-94	369	2,316	427	2,692	-376
95-99	132	660	167	2,835	-175
100 and over	44	176	59	2,236	-60
Total	13	39	18	254	-15
and over	1	2	5	210	-8
Un- known	0	0	0	0	0
Total	12,049	290,303	9,409	201,194	+89,109
Un- known	20		6		

Excludes Mexicans, who are tabulated as white in 1933 and thereafter.  
 Calculated on data from 1940 Life Tables.  
 Source: Bureau of the Census: Mortality Statistics of the United States, 1933; Vital Statistics of the United States, 1944; U. S. Life Tables, 1930 and 1940; U. S. Adjusted Life Table, 1945.

to syphilis is the infant (0 to 1 year) group. This is due to dramatic reductions in syphilis infant mortality rates commanded by the high life expectancy in this group. These rates per 1,000 live births are presented in table 6 for the years 1933 to 1945. The total infant mortality rate for syphilis has been reduced two-thirds, from 0.79 in 1933 to 0.25 for 1945. This reduction is relatively greater in the reduction in the general syphilis mortality rate over the same period. Although the reduction in infant mortality due to syphilis occurred during a period of decline in the total infant mortality

Table 6.—Syphilis infant mortality rate per 1,000 live births, United States, 1933-45

Year	Total	White	Non-white
1933	0.79	0.44	2.95
1934	.74	.41	2.84
1935	.70	.41	2.77
1936	.74	.41	3.07
1937	.69	.37	2.96
1938	.63	.33	2.81
1939	.57	.28	2.61
1940	.53	.25	2.52
1941	.41	.18	2.10
1942	.30	.15	1.50
1943	.25	.12	1.28
1944	.27	.12	1.35
1945	.25	.12	1.26

Source: Mortality Statistics of the U. S. 1933-1936; Vital Statistics of the U. S. 1937-1945.

rate, the syphilis decrease is certainly not a consequence of the general decrease. If related at all, the general decrease would tend to raise the syphilis rate by preventing infant deaths from other causes and thus extending their exposure to the risk of dying from syphilis.

The data presented in this paper up to this point have been those for the total continental United States. Trends for individual States and differences between States in color-specific syphilis mortality rates are given in table 7.

The downward trend since 1938 in national data is paralleled by a similar trend in almost every State. However, the rate differences between States are much more difficult to interpret than the trend lines within any State or for the Nation. The reason for this difficulty is the unknown amount of difference in reporting error which exists between different States. The factors which influence reported syphilis death rates are listed in two groups. It is the second group which contains the factors complicating interstate comparison.

1. The actual number of deaths from syphilis is influenced by:
  - (a) Prevalence of syphilis.
  - (b) Treatment of infections (this might be considered as also affecting (a) above).



(c) Mortality causes other than syphilis which may determine whether an infected person will live long enough to die of syphilis.

2. The reported deaths from syphilis are influenced by all these factors and, in addition, by the following factors:

(a) The difficulty of diagnosing syphilis as a cause of death. This is particularly true of cardiovascular syphilis in patients not seen by the physician before death.<sup>4</sup>

(b) The willingness of physicians to report syphilis as a cause of death when they have made the diagnosis (4). Syphilis as a cause of death may not only be concealed because of still present social taboos but in some population groups it may also be hidden because of restricted industrial insurance policies which exclude syphilis as a mortality risk.<sup>5</sup>

In order to study the relationship between mortality and prevalence, the 1940 color-specific syphilis death rates<sup>6</sup> were

<sup>4</sup> Study of 8,182 autopsies in Magdeburg, Germany, (1928-36) showed that clinical diagnosis of syphilis as the cause of death was increased 26 percent and of syphilitic aneurysm 250 percent when verified by post-mortem examination (3).

<sup>5</sup> In a communication from the Life Insurance Association of America, doubt is expressed regarding the life insurance contract provision's accounting for any failure on the part of doctors to report syphilis as a cause of death. This communication did indicate that misunderstanding of the life insurance contract by the physician may account for some failure to report syphilis.

<sup>6</sup> Age-adjusted to the white and nonwhite 1940 United States populations respectively. This adjustment serves to eliminate the effect of age differences on syphilis mortality. Ordinarily, "older" populations would have higher syphilis death rates as compared to populations with proportionately few surviving to an age when syphilis may be fatal. (See preceding text on factors influencing the actual number of syphilis deaths.)

**Table 8.—Correlation of 1940-41 Syphilis prevalence rates for select with 1940 State syphilis mortality (age-adjusted)**

Color	Area	Correlation	
		Coefficient	Interpretation
White----	United States (36 States and District of Columbia).	0.37	Very low
White----	South (15 States)----	.52	Low.
White----	Non-South (21 States and District of Columbia).	.90	High.
Nonwhite.	United States (36 States and District of Columbia).	-.23	Practically none.
Nonwhite.	South (15 States)----	.04	Practically none.
Nonwhite.	Non-South (21 States and District of Columbia).	.02	Practically none.

correlated with the 1940 color-specific syphilis rates based on selective testing. The findings are briefly summarized in table 8. These selective rates were used as an estimate of the prevalence of syphilis, and it is assumed that the male to female ratio is more or less constant between States. The reported death rates represent estimates of the syphilis mortality. Thus both factors in the correlation are substitute data for the absolute data, which are unavailable.

No correlation (-0.23) was found between the prevalence and mortality rates for the nonwhite population. Among the white population, practically no correlation (0.37) was noted when all States for which complete data were available were used. A study of the distribution, however, made it apparent that this was due to a dissimilar relationship existing between these variates in the South<sup>7</sup> and in the rest of the country. Upon calculation

<sup>7</sup> This rate is used as an "index" of 1940 syphilis prevalence (5). The rates used were those corrected for age and urban-rural differences.

<sup>8</sup> South Atlantic States, excluding Delaware and the District of Columbia, and the Southern States excluding Kentucky (no selective data), plus New Mexico. (Actually the States in U. S. Public Health Service Districts 2, 3, 4, 5, 6, 7, 8, and 9, excepting the District of Columbia.)

Table 7.—*Syphilis mortality rate per 100,000 estimated population—United States and each State<sup>1</sup> 1933-45*

[illegible]

<sup>1</sup> Ten 100-cc. plates of compliance; years 1941-45, place of residence. (Deaths by incidence not available prior to 1940. Occurrence data were used for 1940 to avoid bias.)

<sup>a</sup>For 1940-41, rate reflects deaths among armed forces overseas and are based on population in the State. State populations not estimated by color after 1940.

That is, the white population was less than 10,000.

Source: Reported total. Vital Statistics—Special Reports—State Summaries, Vol. 22, 1945; Vol. 24, 1947; and Vol. 26, 1949. Rates by color: Years 1933 and 1940—Vital Statistics in the United States, 1930-40. Years 1933-44 and 1946-49 computed from Mortality Statistics of the United States and Vital Statistics—Special Reports. The Journal of Statistical Data Information, July 1952.

NOTE: State population estimates by color have not been prepared since 1940. Syphilis mortality trends after this date can be established just for the total population.





g the coefficient of correlation separately for white persons in each of the areas, positive linear correlation of existed for the non-South, but a low relation (0.52) was found for the h. When this South and non-South nction was made for the nonwhite ps, neither area indicated any corre- on. However, the correlation scatter ram for nonwhite persons did reveal ouping (also noted for white persons) e southern States in the quadrant of prevalence rate and low death rate.

is beyond the scope of this paper to mpt final determination of why pre- ce data correlate poorly or not at vith mortality data in five of the six and color groups. Several explana- s may be outlined for checking against her observations:

The lack of correlation in all non- te groups may be a result of the inac- cy of measuring nonwhite syphilis alence based on serologic testing. e support for this viewpoint may be d in a recent report (6). However, an be stated that selectee rates corre- very highly with reported total syph- case rates.<sup>9</sup> It is conceivable that a correlation with diagnosed cases is outcome of the same errors, i. e., se- ee blood testing was not an accurate ex of syphilis and much syphilis is gnosed and reported on the basis of d testing.<sup>10</sup>

The absence of correlation may be tributed to large variation among tes in the proportion of syphilitic ths reported as such. Even after age ustment, the 1940 reported syphilis th rate for the nonwhite population in v York, Pennsylvania, and Delaware more than double the same rate for her Arkansas or North Carolina. Simi- y for the white population, the age-

Correlation of 0.86 for total rates in 1940. e morbidity data not available by color r to 1943. State populations not avail- e by color after 1940.

The percentage of reported syphilis in the nary and secondary stages is lower for white than for white groups (26.9 vs. t in 1947).

adjusted 1940 death rate for Indiana and Washington State is almost triple the rate for either South Carolina or Mississippi.

3. The selective service rates may not be representative of syphilis prevalence in the total population. For purposes of the correlation it is not necessary that the rate of syphilis detected among selectees actually be the prevalence rate in the population. However, if the relationship between the selectee rate and the total rate is not constant for all States, the correlation would be invalidated. Since the selectee rate is based on examination of males aged 21 to 35, it is possible that no constant relationship to the total population may exist. For example, a State with high syphilis incidence up to 30 years ago which has since been sharply reduced may have a low prevalence rate in men aged 21 to 35 and a high prevalence rate in the population age group of 50 to 60 years. Another State with high syphilis incidence many years ago which continued to 1940 would have high prevalence rates in both the 50-60 and in the 21-35 age groups.

4. The treatment of syphilis in the South prior to 1940 may have been more successful and more widespread than in the rest of the United States without markedly reducing the proportion of positive reactions to the serologic test for syphilis.

5. The prevalence of syphilis within color and sex groups may not be correlated with mortality from syphilis.

### Summary

1. Reported death rates from syphilis in the continental United States have been steadily reduced since the passage of the National Venereal Disease Control Act in 1938. This trend is considered to be highly reliable, since known factors (aging of the population and redefinition of aneurysm) and probable improved reporting by physicians have all exerted an upward force on the rate during this period. In spite of this, the observed trend is downward.

2. The downward trend is noted for all

categories of syphilis among the white population and all except paresis among the nonwhite population.

3. Comparison of age-adjusted syphilis mortality rates for sex and color groups indicate nonwhite rates to be about 6 times the white rate and the rate for males about 3 times the rate for females. These ratios are much different from those obtained by comparing reported case rates, in which male and female rates are approximately equal and the nonwhite rate is about 14 times the white rate. Further study is required to determine whether the mortality risk from syphilis among syphilitics does actually vary between color and sex groups to the extent indicated by these data.

4. By combining the effect of increases in median age at death from syphilis with reduced syphilis death rates, a calculation of loss of life-years due to syphilis has been made. This showed that the United States white population lost because of syphilis 89,109 less years of life in 1944 than in 1933.

5. The trend of infant deaths from syphilis per 1,000 live births has been in the same direction as the general syphilis mortality trend during 1933-45, although the rate of decrease has been greater in the infant group.

6. The trend data for almost all States

are parallel to the national trend and similarly interpreted as evidence of reduced syphilis mortality.

7. Except for non-South white populations, apparently no meaningful relationship exists between reported syphilis death rates and syphilis prevalence measured by selective service tests. Color-specific syphilis mortality rates much higher for non-southern States for southern States, when considered in relation to estimated prevalence.

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# The Technic of the Tissue Spread Method for Demonstrating Donovan Bodies

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The following procedures for obtaining, preparing, and staining for microscopic examination the tissue spread specimens for the demonstration of Donovan bodies of granuloma inguinale have been used for several years in the laboratories of the United States Public Health Service Medical Center, Hot Springs, Ark.

## *Selection of Site for Obtaining Specimen*

The lesions of untreated and uncomplicated granuloma inguinale consist principally of soft, red, velvety, elevated, exuberant granulation tissue. These lesions are not painful unless secondarily infected. It is from the subsurface of the granulation tissue that a specimen could be taken for microscopic examination. This tissue is usually rich in Donovan body content.

When the lesions become secondarily infected, they are usually painful; the appearance of the lesions changes to that of a predominantly ulcerative type, and characteristically foul odor develops. Such lesions may contain little or no new granulation tissue. If granulation tissue cannot be found, the specimen is best obtained from the margin of the lesions. Difficulty in demonstrating Donovan bodies is frequently encountered in tissue from this type of lesion.

The more chronic or partially healed lesions are of the cicatricial type, in which it is most difficult to demonstrate Donovan bodies by the tissue spread technic. However, it is usually possible to find small granulomatous areas scattered about the fibrotic scar tissue for fairly satisfactory preparations.

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Aspiration of a pseudobubo often yields very satisfactory specimen material for spread preparation.

## *Cleansing of Area Prior to Obtaining Specimen*

A granulomatous area near the periphery of the lesion is generally chosen for cleansing. Cleansing is accomplished by repeated swabbing with saline-soaked gauze, and this is followed by gently wiping with dry gauze. The granulomatous tissue usually bleeds as a result of the slight trauma occasioned by such cleansing. Ordinarily, it is not necessary to infiltrate the area with procaine or other local anesthetic, prior to cleansing, but this may be done if desired and does not interfere with the subsequent spreading and staining procedures.

Proper cleansing of the lesion is of the utmost importance, for if the surface debris is included with bits of tissue, the resulting preparation is frequently contaminated to such a degree that it is of no value for the microscopic identification of Donovan bodies.

## *Obtaining the Specimen*

Donovan bodies are strict parasites of large mononuclear tissue cells, and therefore tissue must be obtained if their presence is to be satisfactorily demonstrated. Only a small piece of tissue, the size of a match head or slightly smaller, is necessary. The granulomatous tissue is usually friable and can be obtained by using a small, Sims-type, uterine curet; a small bone curet; or the Gaylor-type uterine specimen forceps. In the absence of instruments of this type, thumb forceps and a scalpel may be used. The inclusion of



a small amount of blood with the specimen does not materially interfere with the microscopic examination.

### ***Preparation of Specimen for Staining***

Spreading of the tissue is a relatively simple procedure. The tissue is placed between two microscopic slides. While one slide is held stationary, the other one is moved in either circular or lateral movements; a firm pressure is applied at the same time, to deposit the tissue cells evenly on the surface of both slides. The principal error that can be made here is too prolonged spreading. At the first sign of the tissue becoming dry, or of drying of the deposited cellular film, the spreading should be discontinued. If the spreading is continued beyond this point, the cells are ruptured, thus producing cellular debris, so that the specimen is not satisfactory for subsequent microscopic examination. The proper amount of pressure and length of time of spreading are readily learned through spreading and examining a few pieces of tissue. It is advisable to spread the tissue immediately after it is obtained, so that drying does not occur. However, if not spread immediately, the tissue may be placed between layers of saline-soaked gauze in a Petri dish, or similar dish, to prevent drying. It is impossible to spread tissue after formalin or similar fixation.

The fibrotic tissue sometimes obtained from the cicatricial type of lesion is not satisfactory for preparing tissue spreads. The pressure upon the slides and the spreading movements that are necessary with this type of tissue are so great that preparation of satisfactory tissue spreads is almost impossible. Because of its fibrotic consistency and usual paucity of Donovan bodies, this type of tissue is best examined by studying histologic sections.

### ***Staining***

It is perhaps superfluous to describe the staining technic in detail since either the well-known Wright's or Giemsa's

stain is generally used. With either these stains the Donovan bodies are well stained if the same time and dilution factors are used that have been found satisfactory with the particular lot of stain that is in routine use for differential blood-count staining. A stain staining technic that results in either weakly basic or acid staining is not satisfactory. A weak basic stain results in too faint staining of the basophilic Donovan bodies and nuclei of tissue cells. Weak acid staining may not satisfactorily stain the acidophilic capsular substance.

### ***Microscopic Appearance of the Donovan Body***

The Donovan body as found in tissue spread preparations may appear coccoid, diplococcoid with or without a close safety-pin appearance, or as straight or slightly curved rods with either homogeneous or metachromatic staining. These organisms have an affinity for basic stains, and with Wright's stain the appearance may vary from light blue through the deeper shades of blue to purple or purplish black. They may appear noncapsulated, with or without a clear, nonstaining halo, or they may be encapsulated.

The appearance of the capsule is apparently dependent upon the age of the organism. The immature Donovan body is surrounded by a clear, nonstaining halo. Capsule staining first appears as a faint pink-staining ring at the periphery of the halo. As the organism ages, more and more of the halo area stains pink until the whole area is stained. The stained appearance of the capsular substance, which is dependent upon the age of the organism, varies from pink through the deeper shades of red to purple or purplish black. With the most mature, perhaps somewhat degenerative form of the capsule substance stains so intensely that a differentiation cannot be made between the Donovan body and the capsular substance. There are different degrees

capsule staining in each preparation is generally in each parasitized cell. The blue-staining Donovan body, surrounded by a pink-staining capsule, is frequently referred to as the nucleus of the Donovan body. This is considered a misnomer. The diplococci of an encapsulated pneumococcus are not considered the nucleus of the pneumococcus, and neither should the Donovan body be considered a nucleus when it becomes encapsulated. The Donovan body, at all ages or stages of maturity, may be found either extracellularly or intracellularly. When found intracellularly, Donovan bodies are contained in the cytoplasm of large, mononuclear, endothelial cells. A positive report can be made only upon finding the intracellular organisms with some degree of capsule staining. If the large mononuclear cell cytoplasm is not well defined (frequently it is not), the organisms may have such proximity to a large mononuclear cell nucleus that they may be assumed to be intracellular and may be reported positive. The immature organisms, either with or without a halo, may be simulated by bacteria and may represent only presumptive evidence of Donovan body infection. A positive report should not be made if only immature organisms are found. Some preparations contain myriads of noncapsulated forms in which it is difficult to find organisms showing capsule formation. However, if a diligent search is made, encapsulated forms can usually be found.

Among those not familiar with Donovan bodies there appears to be considerable confusion in distinguishing between Leishman-Donovan bodies (*Leishmania donovani*) of kala-azar and Donovan bodies of granuloma inguinale. The only similarities they have are that they both parasitize the same type of cell, have identical forms, and the name "Donovan." The Leishman-Donovan bodies are larger than Donovan bodies and have a bluish-staining cytoplasm. The capsule of the Donovan body, corresponding morphologically to the cytoplasm of the Leishman-Donovan body, stains pink or shades of red. The Leishman-Donovan body has a

large eccentrically placed nucleus with a small rodlike parabasal body. The so-called nucleus of the Donovan body is smaller and more centrally located; and if the so-called nucleus of the Donovan body is in two parts, the parts are fairly equal in size and shape. There is no morphologic similarity between Leishman-Donovan bodies of kala-azar and Donovan bodies of granuloma inguinale.

### **Microscopic Examination of Stained Spread**

It is best to examine the stained spread with the low-power (16-mm.) objective and 10 × ocular, after first covering the slide with a thin film of oil. This permits the location of areas of well-distributed large mononuclear cells. The finding of only cellular or other debris indicates that the specimen was either improperly obtained or poorly spread, and a repeat specimen should be requested for the benefit of the microscopist, clinician, and patient.

When an area of satisfactory cellular content is located, it is carefully examined for Donovan bodies, using the oil immersion (1.8-mm.) objective. A positive report may be made upon finding intracellular Donovan bodies with some degree of capsule staining as previously described.

A considerable amount of microscopic study may be effected with the low-power objective after sufficient experience has been gained in identifying Donovan bodies. Under low-power magnification the organisms appear as a cytoplasmic or perinuclear stippling in the large mononuclear cells. This technic is frequently helpful for quickly finding Donovan bodies for final identification under oil immersion. A negative report should not be made if Donovan bodies are not found using the low-magnification technic. Oil-immersion magnification will sometimes demonstrate immature, extracellular mature, or suspicious organisms that warrant further examination of the slide or a request for another specimen.

In addition to Donovan bodies in the tissue spreads of suspected cases, there

may also be evidence of a concurrent fusospirochetosis or chancroid disease, and occasionally presumptive evidence of other pathologic conditions. It is permissible to report evidence of fusospirochetosis or chancroid disease, if found. However, it is recommended that the decision as to the presence or absence of other pathologic lesions should be made after histologic examination of sectioned tissue.

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EDITOR'S NOTE: This article was prepared by Mr. Cannefax as a result of

many requests for concise information relating to laboratory techniques which aid the diagnosis of granuloma inguinale. Microscopic slides, with Donovan bodies encircled for rapid location and demonstration, are being accumulated and are available through the author. Reprints of this article will also be ready for distribution within a few weeks of publication of this issue of the JOURNAL OF VENEREAL DISEASE INFORMATION. Requests for both reprints and slides should be addressed to Mr. Cannefax.

## Neurosyphilis in the Tropics<sup>1</sup>

Martin J. Cook, M. D.<sup>2</sup>

"Syphilis is kind in the tropics; neurosyphilis is rare in the Negro." Such statements are to be found in most books on tropical medicine and are generally accepted by physicians practicing in the tropics. There is little to contradict this point of view in the literature of the past 15 years. Gordon (1), in a poorly controlled series, concluded that neurosyphilis is not rare among Kenya natives. Kirschbaum (2) found that tabes, optic atrophy, and paresis do not differ in incidence or kind among Negro and white psychiatric cases. Hudson (3) claimed that neurosyphilis is rare among Euphrates Arabs; however, his study was not well controlled and it lacked cerebrospinal fluid examinations.

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<sup>1</sup> The laboratory work was performed under the direction of Ralph B. Hogan, Surgeon, U. S. Public Health Service. S. O'Brien Payne, formerly Senior Assistant Surgeon (R), U. S. Public Health Service, assisted in the clinical studies.

<sup>2</sup> Formerly Senior Assistant Surgeon, U. S. Public Health Service.

Initial experiences in Trinidad, B. W. I., led the author to discount the belief of most of the local practitioners that neurosyphilis is comparatively rare in the area. The lack of adequate diagnostic facilities, both clinical and laboratory, seemed responsible for this belief. Reports from other tropical areas indicate that similar deficiencies may account for the supposedly low incidence of neurosyphilis elsewhere in the tropics. Our approach in this study was to apply methods standardized by the United States Public Health Service. The patients were an unselected group gathered largely through a program of mass blood testing, which is an ideal way of gathering a representative group of syphilitics. The presence of yaws was a complicating factor. In the presence of a positive serologic test for syphilis (STS), the following criteria were used to make a diagnosis of yaws and to exclude syphilis:

- (a) The presence of typical active lesions of yaws



(1) The presence of typical scars of yaws<sup>3</sup> with a low titer STS (usually less than 8 Eagle units), a history of residence in an endemic yaws area, and a history of treatment for yaws in childhood

(2) A negative cerebrospinal fluid (CSF)

Where any doubt existed, a diagnosis of syphilis was made. A number of cases of active yaws were undoubtedly called syphilitic because of this policy. Of 108 cases given an initial clinical diagnosis of active or tertiary yaws, only two showed CSF abnormalities; and of these two, one almost certainly had syphilis rather than or in addition to yaws.

The procedure followed in this study was to perform a routine STS. If positive, it was repeated; and if the second was positive, the patient was put through a diagnostic clinic for a thorough physical examination. In most instances the spinal fluid examination could not be performed until after antisyphilitic therapy had been started. This may have caused us to miss a few initially positive spinal fluids which became negative under treatment. The Eagle and Kahn tests were used for the blood specimens. A cell count, the Pandy test for determination of protein, the Eagle modification of the Wassermann complementation test, and an Eagle flocculation test were performed on all cerebrospinal fluids. Colloidal gold curves were not made.

The cerebrospinal fluid examinations of 1,028 patients were reviewed. The results are presented in table 1.

Many syphilologists consider increased cell counts with no other abnormalities

Such scars do not differ materially from those of late syphilis. The most distinguishing characteristics of the scars of yaws are (1) that they are found by history to have originated early in the patient's life, (2) that the changes are frequently encountered in association with the scars of yaws, and (3) that such scars usually appear on the extremities (arms and legs) as flat, multiple, atrophic scars with somewhat stellate, puckered mar-

(table 1, group *b*) as evidence of neuro-involvement. Although we accept this point of view in practice, in this study we chose to exclude such cases from the group termed neurosyphilitic. Group *c* in table 1 consists of fluids with normal or moderately elevated cell counts, normal or increased protein, and complement-fixation tests positive in the range from 0.1 cc. to 1.0 cc. Fluids in group *d* showed high cell counts, increased protein, and complement-fixation tests positive in quantities less than 0.1 cc. For those familiar with the classification of the Cooperative Clinical Group (CCG) (*4*), group *b* corresponds approximately with group I (CCG), group *c* with group II (CCG), and group *d* with group III (CCG). Four cases of *tabes dorsalis* were found among the group with normal fluids. Other than these four, no case was termed neurosyphilitic in the absence of group *c* or *d* classification.

**Table 1.—Cerebrospinal fluid findings on 1,028 patients**

Group	Number of cases	Percent of total
<i>a.</i> Normal fluids <sup>1</sup> .....	823	80.0
<i>b.</i> Fluids showing increased cell counts (6 to 150 cells per mm. <sup>3</sup> ) but no other abnormalities.....	52	5.1
Positive fluids <sup>2</sup> .....	153	14.9
<i>c.</i> Showing minimal to moderate changes.....	126	12.3
<i>d.</i> Showing marked changes.....	27	2.6
Total.....	1,028	100.0

<sup>1</sup> 4 cases of *tabes dorsalis* diagnosed in this group.

<sup>2</sup> As defined in this study.

The clinical records of 527 of the total patients were studied, and the CSF findings were correlated with their final diagnoses. Of these 527 cases, 9 were finally diagnosed as being nonvenereal and 9 were diagnosed as having gonorrhea, granuloma inguinale, or lymphogranuloma venereum. Of the total of 527 cases, 82 or 15.5 percent were diagnosed as neurosyphilitic and classified as shown in table 2.

The clinical records of 501 patients were not correlated with the CSF findings. In

**Table 2.—Classification of type of neurosyphilis found among 527 clinically analyzed cases**

Diagnosis	Number of cases	Percent of total cases
Asymptomatic neurosyphilis.....	48	9.1
Symptomatic neurosyphilis.....	34	6.4
Tabes dorsalis.....	13	2.5
Taboparesis.....	1	.2
Paresis.....	5	.9
Meningovascular.....	5	.9
Vascular.....	2	.4
Optic atrophy (without other clinical evidence of neurosyphilis).....	8	1.5
Total neurosyphilis.....	82	15.5

this group, there were 73 positive spinal fluids (14.6 percent). This result agrees so closely with the clinically analyzed group that there is reason to believe that the findings would have been no different had it been possible to examine the records of the entire group of 1,028 cases.

Optic atrophy was not considered syphilitic unless associated with a positive CSF or with other clinical evidence of neurosyphilis. An optic atrophy apparently based on nutritional deficiencies was seen fairly often among nonsyphilitics. The ocular findings among the clinically analyzed cases are summarized in table 3.

**Table 3.—Ocular involvement among 527 clinically analyzed cases**

	Optic atrophy	Uveitis	Interstitial keratitis
In patients with a positive STS:			
CSF positive, or other signs of neurosyphilis present.....	9	1	1
CSF negative; no other signs of neurosyphilis.....	6	2	3
In patients with a negative STS and negative CSF.....	2	0	0

There are included among the 527 cases 107 patients whose final diagnosis was inactive yaws and 3 patients with active osseous and cutaneous yaws. A total of 110 patients (20.9 percent) of the group thus had a final diagnosis of yaws. The

incidence of active yaws is low because typical cases of active yaws were planned on treatment as soon as the diagnosis was made and did not routinely have C examinations. Our policy of considering a case syphilitic when in doubt makes percent a conservative estimate of amount of yaws among patients with positive STS. By eliminating 110 of original 527 patients, 417 patients remain who were considered syphilitic. On this basis, table 4 is presented.

**Table 4.—Incidence of neurosyphilis among 417 cases remaining after correction to eliminate yaws**

Diagnosis	Number	Percent of total
Asymptomatic neurosyphilis.....	48	11.5
Symptomatic neurosyphilis.....	34	8.1
Total neurosyphilis.....	82	19.6

The population of Trinidad is cosmopolitan. The largest racial group is Negro. There is a good deal of intermarriage between races, but most of the individuals termed "mixed" are predominantly Negro. Table 5 demonstrates the distribution of races among the neurosyphilitics is essentially the same as the racial distribution among the entire group under study.

The relatively high incidence of neurosyphilis found in this study cannot be attributed to a racial factor. Rather, it appears that the rate among Negroes compares fairly well with that among white persons in the colder climates. Moorhead (5) estimates that about 25 percent of syphilitics will eventually develop clinical evidence of neurosyphilis; he includes latent asymptomatic neurosyphilis in this estimate. Goldblatt (6), in a study of syphilitic Negroes in Cincinnati, found that 2 percent showed some form of neurosyphilis; he included in this group patients with negative complement-fixation tests but with increased cell counts in the CSF. Thus, our conservative figures agree well with those obtained in the United States.

Table 5.—*Racial distribution among total patients and among neurosyphilitics*

	Total		Negro		Mixed		East Indian		White		Chinese	
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent
total patients.....	1,028	100.0	848	82.5	110	10.7	55	5.4	10	0.9	5	0.5
neurosyphilitics, both sympto- matic and asymptomatic.....	155	100.0	134	86.4	11	7.1	8	5.2	0	-----	2	1.3

### Conclusion

Neurosyphilis is not a rarity in the tropics. The application of modern clinical and laboratory methods in other areas will undoubtedly confirm our finding of a neurosyphilis rate of 20 percent in unselected syphilitics. It may be that symptomatic neurosyphilis tends to be a more severe affliction among natives of the tropics than among North Americans and Europeans. However, severe neurosyphilis is frequent enough to warrant early attention to the cerebrospinal fluid in all cases of syphilis. The severity of neurosyphilis may be somewhat tempered by the presence of endemic malaria. Malaria rates of 20 to 80 percent existed in

some areas from which our patients were drawn.

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# Reliability of 24-Hour Incubation for *Gonococcus* Cultures on Ascitic Fluid-Tyrothricin-Difco Chocolate Agar

Jean Johnston, A. B., M. A.<sup>1</sup>

This study is a continuation of work reported previously, in which comparative readings were made of 200 positive gonococcus cultures plated in duplicate and read at 24 and 48 hours (1). The medium used in the original series had the following formula: 1,000 cc. of Difco chocolate agar, 300 cc. of sterile ascitic fluid, and 1.25 cc. of 2-percent tyrothricin. Inasmuch as the cultures read after 24-hour incubation yielded a recovery of more positives than did those incubated for 48 hours, and for other advantages inherent in the shorter incubation period, 24-hour readings on the above medium were adopted as a routine procedure in this laboratory.

In order to establish definitely the reliability of 24-hour incubation on the ascitic fluid medium, a second series of cultures plated in duplicate was prepared. In this series, 24-hour readings on ascitic fluid medium are compared with 48-hour readings on Difco chocolate agar with the addition of 1-percent Supplement A. Of 200 positive cultures plated in duplicate, 197 (98.5 percent) were positive on ascitic fluid medium at 24 hours, and 189 (94.5 percent) were positive on Supplement A chocolate agar medium read at 48 hours.

A second duplicate series is reported wherein a 24-hour incubation on Supplement A chocolate agar is compared with a 48-hour incubation period on the same

medium. Sixty-eight duplicates were indicative that a period of 24 hours was sufficient incubation time to produce positive results on this medium. Of the plates positive at 48 hours, only 54 were positive at 24 hours.

The addition of 30-percent ascitic fluid to Difco chocolate agar produces a medium with a reduced agar content. This softer medium may be responsible for faster growth of the gonococcus. From plates with a moist surface are always desirable for successful gonococcus culture.

Great care is used in this laboratory in mixing and pouring mediums, so that thermolabile substances present in ascitic fluid are not destroyed by subjection to elevated temperatures in mixing, or the loss of moisture as steam in pouring. The medium is poured at such a temperature that practically no moisture gathers on the surface of the medium or on the cover of the Petri dish. Water of condensation on the surface of the plate favors the development of spreaders and resultant loss of positives through overgrowth.

In the preparation of the medium, the hemoglobin solution and melted base agar are taken from the autoclave. The flask of hemoglobin is placed in a pan of cold water; the agar in a pan of hot water. The hot water prevents the solidification of agar on the wall of the flask. The tyrothricin is added to the ascitic fluid and this mixture at a temperature of 15° C., is added to the hemoglobin which has been held at a temperature of 50° C. The agar, at 60° C., is poured into the hemoglobin-ascitic fluid-tyrothricin mixture. The completed medium at a temperature of 45° C., is then poured in sterile Petri dishes.

The addition of whole blood to Dif

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The author wishes to thank Dr. David Frost, Chief, Bureau of Venereal Diseases, Oakland Department of Public Health, and Drs. Malcolm H. Merrill and Howard L. Bodily of the Division of Laboratories, California State Department of Public Health, for their interest and valuable suggestions in carrying out this problem.

teose agar No. 3, in place of dehydrated hemoglobin, in the preparation of chocolate agar is recommended (2). Pizer's and McLeod's mediums are considered superior to mediums made from dehydrated ingredients, because of the nutritive values present in freshly prepared meat infusion (3). The preparation of such mediums is time-consuming, and for laboratories without facilities for such work, Difco chocolate agar with the addition of ascitic fluid is recommended. It is easily prepared and must, to a certain extent, elements present in the more elaborate mediums made from fresh meat, serum, or whole blood.

Any State, county, or city health department should be able to get a constant supply of ascitic fluid from hospitals in the area. Sterile gallon or half-gallon bottles, supplied by the laboratory and stored at the hospitals, will insure a collection of the valuable fluid when a patient is tapped. The California State Department of Public Health, Division of Laboratories, supplies sterile ascitic fluid in 30-cc. ampules to small outlying laboratories doing a small number of cultures.

The addition of 30-percent ascitic fluid to the Difco chocolate agar extends the medium by that amount and cuts down the cost per culture.

The procedure for handling cultures at this clinic is as follows: Material for culture is obtained on small, hard, sterile swabs and placed in 0.5 cc. of holding fluid composed of equal parts of sterile ascitic fluid and proteose peptone No. 3 broth. Urethral cultures are taken from males. From females, urethral and cervical cultures are obtained, and the two swabs are placed in the same holding fluid. The cultures are held in the ice box until plated; the interval between taking the cultures and the plating is generally less than an hour and never exceeds 3 hours.

In inoculating plates, one-half the surface is streaked heavily with the swabs in obtaining material for culture. A sterile wire spreader is used to carry

inoculum over the remaining surface of the medium according to the standard procedures. Such a spreader prevents the digging up of the soft medium.

For this series of duplicate cultures reported, one plate was streaked, and the swab or swabs were replaced in the holding fluid. Within 1 to 2 minutes the duplicate plate was streaked. No record was made of the order in which the plates were streaked, as it has been shown previously that the order of streaking has no effect on the final results (1).

When the cultures were read, a record of the approximate number of gonococcus colonies and of contaminating colonies was made as well as of the size of the colonies.

In obtaining the 200 positive cultures for comparison of 24-hour incubation on ascitic fluid medium with 48-hour incubation on Supplement A medium, about an equal number were plated which were negative on both plates. Included in the series were undiagnosed males suspected of having gonorrhea, and the first culture taken on undiagnosed females. All patients were from the Oakland Venereal Disease Clinic. Of the 200 positive cultures, 85 were from males and 115 were from females.

A summary of the relative number of gonococcus colonies and contaminating colonies appearing on the duplicate plates is given in table 1.

In this duplicate series it must be borne in mind that there are two variables: incubation time and the medium. Of the cultures positive on one plate and negative on the other, the following factors were noted:

Three cultures were negative on the 24-hour ascitic fluid plate and a large number of gonococcus colonies developed on the 48-hour Supplement A plate.

Eleven cultures were positive on the 24-hour ascitic fluid plate and negative on the 48-hour Supplement A plate.

Seven of the eleven failures on the 48-hour Supplement A plate were apparently due to excessive number and size of contaminants.

Table 1

	Female	Male	Total
Total positive cultures.....	115	85	200
Cultures showing a maximum number of gonococcus colonies and small number of contaminants on both plates.....	39	57	96
Cultures showing equal number of gonococcus colonies and small number of contaminants on both plates.....	64	60	124
Cultures showing a larger number of contaminating colonies on 48-hour Supplement A plate than on 24-hour ascitic fluid plate.....	37	16	53
Cultures showing a smaller number of gonococcus colonies on 48-hour Supplement A plate than on 24-hour ascitic fluid plate.....	21	10	31
Cultures negative on 48-hour Supplement A plate and positive on 24-hour ascitic fluid plate.....	10	1	11
Cultures showing a larger number of gonococcus colonies on 48-hour Supplement A plate than on 24-hour ascitic fluid plate.....	1	5	6
Cultures positive on 48-hour Supplement A plate and negative on 24-hour ascitic fluid plate.....	1	2	3

The remaining four cultures negative on the 48-hour Supplement A plate were practically free of contaminating colonies.

As shown in table 1, a large percentage of cultures from both male and female patients show a large number of gonococcus colonies and a small number of contaminants. In a small percentage of cases, particularly from female patients, a very small number of gonococci and a large number of contaminants are obtained on the swabs, and even with the best cultural technic some of the positives are lost.

When the inoculum contains many contaminants and only a few gonococci, three methods for recovering positives are in use in this laboratory.

One method is to use an appropriate medium (in this laboratory, ascitic fluid-tyrothricin-Difo chocolate agar medium) and to cut down the incubation period from 48 to 24 hours. The results of 200 duplicate positive cultures on ascitic fluid medium read at 24 and 48 hours were reported previously (1).

Any culture from a female patient

which shows a large number of contaminants and is negative for the gonococcus or any plate completely overgrown spreaders, is reported as "culture overgrown." For the next and all succeeding cultures taken on such a patient, the urethral and cervical swabs are placed in separate tubes and are cultured on separate plates. From the results of a large number of separated urethral and cervical cultures it has been shown that in the majority of cases on ascitic fluid-tyrothricin-Difo chocolate agar, the urethral cultures show the bulk of the contamination, whereas the cervical cultures may be sterile or show only an occasional contaminant. It has also been observed in this laboratory and reported by Roseblatt, Meyer, and Robbins (4) that when only one of the two cultures is positive the gonococcus colonies are more often found on the cervical plate—frequent in very small numbers. Thus, by plating the two swabs separately, the gonococci present on the cervical swab are more apt to survive than when plated with the heavy contamination present on the urethral swab.

A third method of recovering positives from heavily contaminated material is to inoculate two plates. The first plate is inoculated with the swabs according to the standard procedure. For the second plate, the swabs are replaced in the holding fluid, gently agitated to free mucoid material, wrung out against the side of the tube, and then discarded. The fluid is drawn up and down several times with a pipette to break up the secretion. From 0.01 to 0.02 cc. is spread over the surface of the plate. True cervical secretion is tenacious and mucoid in character and does not spread evenly with the usual technic of making cultures. From the minute inoculum an occasional positive is obtained when the standard plate is negative.

### Summary

1. Of 200 positive gonococcus cultures plated in duplicate, 197 (98.5 percent) were positive after 24-hour incubation on ascitic fluid-tyrothricin-Difo chocolate



er; and 189 (94.5 percent) were positive after 48-hour incubation on Difco chocolate agar with the addition of Supplement A.

Of 68 positive gonococcus cultures plated in duplicate on Difco chocolate agar with Supplement A, 54 were positive after 24-hour incubation, and 68 were positive after 48-hour incubation.

Prolonged incubation and/or presence of excessive number of contaminants are shown to be factors in the loss of positives.

A 24-hour incubation period on aspartate fluid-tyrothricin-Difco chocolate agar is recommended as a reliable procedure for gonococcus culture.

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## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of articles concerned with venereal diseases or related subjects which have been published in the better-known journals during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

### A. HEART J., ST. LOUIS

aneurysm of the pulmonary artery: review of the literature and report of a case. Ralph A. Deterling, Jr. and O. Theron Claggett. 34: 471-499, Oct. 1947.

Electrocardiographic changes in early syphilis. Howard P. Steiger and Joseph Edeiken. 34: 674-690, Nov. 1947.

Myocarditis. A classification of 1402 cases. Ira Gore and Otto Saphir. 34: 827-830, Dec. 1947.

### A. J. M. SC., PHILADELPHIA

Variations in susceptibility to therapeutic malaria. Frederic T. Becker, Lawrence I. Kaplan, Hilton S. Read and Mark F. Boyd. 211: 680-685, June 1946.

Penicillin treatment of acute syphilitic nephrosis and iritis. Report of a case. Harold A. Tucker. 211: 718-722, June 1946.

Positive reactions to the Kahn test for syph-

ilis—their incidence and meaning in healthy American men. A survey of 82,070 U. S. Maritime Service enrollees. Irving J. Wolman. 212: 280-288, Sept. 1946.

The treatment of syphilis of the central nervous system with penicillin. Albert Heyman. 213: 661-670, June 1947.

Persistence of penicillin in the cerebrospinal fluid after massive intravenous administration. Robert L. Barton, Lydia Marshak, Theodore J. Bauer and Leo Loewe. 214: 50-52, July 1947.

Persistent familial [non-specific] serologic flocculation reactions for syphilis suggesting an hereditary mechanism. Arthur G. Singer and Fred Boerner. 214: 89-93, July 1947.

Dissecting aneurysms. A presentation of ten case reports and a correlation of clinical and pathological findings. Albert S. Warren and Albert L. McQuowen. 215: 209-219, Feb. 1948.

\*Cardiovascular syphilis. Review. I. Ogden Woodruff. 4: 248-278, Feb. 1948.

Agranulocytosis in induced tertian malaria. Benjamin R. Gendel, Mark M. Kroll and Alfred D. Leone. Case Report. 4: 309-312, Feb. 1948.

\*Serum concentrations of penicillin G in man following intramuscular injection in aqueous solution and in peanut oil-beeswax suspension. Harold A. Tucker and Harry Eagle. 4: 343-354, Mar. 1948.

Morphologic studies in syphilitic lesions during the Herxheimer reaction. Walter H. Sheldon and Albert Heyman. Abstract of paper presented at the second annual meeting of the Southern Society for Clinical Research, held at New Orleans, Jan. 1948. 4: 459, Mar. 1948.

**Cardiovascular syphilis. Review. I. Ogden Woodruff. Am. J. Med., 4: 248-278, 1948.**

The author presents a review of cardiovascular syphilis and states that syphilis of the aorta and its complications comprise 13 to 15 percent of all cardiac diseases found at autopsy. Any apparent increase in the incidence of the disease in recent years, he states, is due to the heightened index of suspicion which has enabled detection of more cases and to the increase of the average life span in the last quarter of a century.

The autopsy findings in 41 patients with primary aortitis occurring at Bellevue Hospital between 1929 and 1946 are presented and discussed. Of these patients, although 68 percent died after they had reached their fiftieth year, 67 percent did not show symptoms until that age; 45 percent with aneurysms lived beyond the age of 60 (the age in which the greatest number died); and 70 percent survived to their fiftieth birthday. In the Negro group of 12 patients in this series, 67 percent were dead at the age of 50 and 50 percent of these died from aneurysms.

In the patients with aortic valvulitis with insufficiency, calcific infiltration of the ring and leaflets was present to a much greater degree than anticipated, occurring in 7.3 percent of the patients. Damage to the aortic valve with resultant insufficiency was found in 32 (78 percent) of the patients, in 28 of whom con-

firmatory clinical evidence of an aortic diastolic murmur was found. Ostial involvement occurred in 27 percent of 1 cases of incidental aortitis; in the primary cases of aortitis this condition was found in 51 percent, and in 39 percent of the cases both right and left ostia were conjointly involved. The author states that there are only two cases of syphilitic endarteritis of the coronary arteries reported in the literature.

Syphilitic aortic aneurysm is reported to have occurred in 49 percent of the Bellevue Hospital series.

A brief outline of therapy for cardiovascular syphilis is presented with advice to start treatment of all patients with uncomplicated syphilitic aortitis with bismuth rather than the more active spirocheticidal drugs. At present, it is stated, there is too little knowledge regarding the treatment of cardiovascular syphilis with penicillin to discuss it intelligently, but the weight of evidence seems to indicate that syphilitic aortitis will not be permanently arrested unless arsenical therapy is included in the course of thorough and prolonged treatment. The arsenical of choice is stated to be arsenoxide (mapharsen, clorarsen or similar preparations).

**Serum concentrations of penicillin G in man following intramuscular injection in aqueous solution and in peanut oil-beeswax suspension. Harold A. Tucker and Harry Eagle. Am. J. Med., 4: 343-354, 1948.**

The authors point out that the available data with respect to the serum concentrations of penicillin in man deal largely with amorphous preparations containing several penicillins in unknown proportions. They present a study of the average serum concentration provided by a given dose of penicillin at varying periods after its administration.

Data are reported on serum penicillin levels in 138 patients following the intramuscular injection of crystalline sodium penicillin G in aqueous solution or in peanut oil-beeswax suspension.

A 6-percent solution (60 mg. per cubic centimeter, equivalent to 100,000 Oxford

s) was prepared for administration. The volume injected was adjusted to the weight to give dosages of 10, 3, 1.5, 0.3, or 0.15 mg. per kilogram (total dosages of 18,000 to 1,200,000 units in the average adult). The largest single injection was 12.0 cc. (1,200,000 units), and the smallest was 0.11 cc. (11,000 units). One hour after these dosages, the blood levels were 0.095, 0.17, 0.38, 1.1, 3.5, and 11 mg. per cubic centimeter, respectively. At all dosages the serum concentrations fell off at the same initial rate of approximately 70 percent per hour, but after the first few hours they fell off more slowly. Calculations are presented for the median serum concentrations after the administration of penicillin at the varying dosages, and the pharmacologic significance of the resulting curves is discussed.

Peanut oil-beeswax mixtures were given in dosages of 1.5, 3.0, and 10.0 mg. per kilogram. As has been found by numerous previous workers, the highest serum level was not attained for several hours after administration, and the peak concentrations were lower than after a corresponding dose of the aqueous product. Seven of eight patients given 10 mg. per kilogram had measurable levels 24 hours after the injection, and at a dosage of 3 mg. per kilogram, 8 of 11 then had measurable concentrations. After an injection of 1.5 mg. per kilogram, however, the 24-hour serums of only 4 of 7 of the patients and none of the 24-hour serums contained measurable quantities of penicillin. In the first 8 to 12 hours the serum levels of patients given peanut oil-beeswax suspensions showed a degree of variation comparable to that observed in patients receiving the aqueous solutions.

The tables and graphs which detail this study enable the physician to determine the frequency at which a given dose should be injected and the dosage of penicillin which should be given at stated intervals in order to maintain a given concentration of penicillin in the plasma.

J. PUB. HEALTH, ALBANY

Hospital-health center programs in Latin America. [V. D. control.] Richard J. Plunkett. 38: 530-533, Apr. 1948.

AM. J. ROENTGENOL., SPRINGFIELD

Extrinsic lesions affecting the rectosigmoid. [Lymphogranuloma venereum.] Richard H. Marshak. 58: 439-450, Oct. 1947.

ANN. INT. MED., PHILADELPHIA

The preponderance of right hydrothorax in congestive heart disease. [Syphilitic heart disease.] Edgar M. McPeak and Samuel A. Levine. 25: 916-927, Dec. 1946.

Treatment of cardiovascular syphilis with penicillin. Henry I. Russek, John C. Cutler, Stephen A. Fromer and Burton L. Zohman. 25: 957-959, Dec. 1946.

Penicillin in the treatment of early syphilis. 429 patients treated with 1,200,000 units in 90 hours. Robert M. Craig, George X. Schwemlein, Robert L. Barton, Theodore J. Bauer and Herman N. Bundesen. 27: 225-230, Aug. 1947.

The use of BAL [2,3-Dimercaptopropanol] in the treatment of agranulocytosis following intensive arsenotherapy for syphilis. Howard L. Holley. 27: 231-238, Aug. 1947.

Acquired resistance to antibiotics. Editorial. 27: 317-319, Aug. 1947.

The incidence of heart disease in 2,000 consecutive autopsies. [Including syphilis.] William B. Wartman and Herman K. Hellerstein. 28: 41-65, Jan. 1948.

Rheumatism and arthritis. Review of American and English literature of recent years. [Ninth Rheumatism Review.] Part I. Philip S. Hench, Walter Bauer, Edward W. Boland, Darrell C. Crain, Richard H. Freyberg, Wallace Graham, W. Paul Holbrook, L. Maxwell Lockie, Currier McEwen, Edward F. Rosenberg and Robert M. Stecher. 28: 66-168, Jan. 1948.

ANN. SURG., PHILADELPHIA

Spontaneous rupture of the malarial spleen. Case report and analysis of 64 reported cases. Falls B. Hershey and Joseph M. Lubitz. 127: 40-57, Jan. 1948.

ARCH. DERMAT. & SYPH., CHICAGO

Survey of pathologic studies of cutaneous diseases during World War II. [Including venereal disease.] Arthur C. Allen. 57: 19-56, Jan. 1948.

\*Lymphogranuloma venereum. Observations on three hundred and eighty-eight patients at Bellevue Hospital. Maurice J. Costello and Charles S. D'Avanzo. 57: 112-121, Jan. 1948.

Cutaneous diseases among Army personnel in Japan. [Including venereal disease.] Harry Siegel. 57: 128-131, Jan. 1948.

**Lymphogranuloma venereum. Observations on three hundred and eighty-eight patients at Bellevue Hospital.**



Maurice J. Costello and Charles S. D'Avanzo. Arch. Dermat. & Syph., 57: 112-121, 1948.

A report is presented of observations on 388 patients with lymphogranuloma venereum who were admitted to the dermatologic wards at Bellevue Hospital in the 10-year period from 1936 to 1945, inclusive. Of these, 317 were men and 71 were women. Two hundred and eighty-three were Negroes. The average age of the patients was 30.4 years. The average duration of the inguinal adenopathy prior to hospitalization was 30.7 days, while the average duration of the disease in patients with rectal changes previous to hospitalization was 32.2 months.

In 344 patients, the genitals and inguinal lymph nodes were primarily involved. Of these, 302 were men. In 40, of whom 26 were women, the anorectal region was involved. There were 31 patients with rectal stricture, 25 percent of which occurred in men. Nine patients with proctitis were seen. The average temperature on admission of patients with inguinal involvement was 100° F. Of the patients with genitoinguinal involvement, 101 had a primary lesion. Only those lesions in which *Treponema pallidum*, *Haemophilus duereyi*, and Donovan bodies were not seen in repeated darkfield examinations, in which the reaction in the autoinoculation test for chancroid was negative, and which occurred in patients who had lymphogranuloma venereum or in whom it developed in a short time were considered as primary lesions of the disease. The evidence is thus presumptive and made by exclusion.

Ninety-nine of the patients in this series also had a diagnosis of syphilis, while 27 had concomitant gonorrhea and lymphogranuloma venereum, and 20 had a coexistent chancroid with lymphogranuloma venereum.

Of 380 patients given an intradermal test with Frei antigen, 365 yielded a positive reaction. Of 86 patients receiving an intravenous test with Frei antigen, a positive reaction was elicited in 74 cases. The authors state that if the

reaction in the intradermal test with Frei antigen is negative at first, it should be repeated in patients with early enlargement of inguinal lymph nodes. Patients having urethral discharge with inguinal adenopathy should have an intradermal test with Frei antigen, since nonspecific urethritis may be the initial manifestation of lymphogranuloma venereum.

Various methods of treatment were employed. Prior to the use of sulfonamide drugs, routine treatment consisted of aspiration of the buboes and the administration of antimony potassium tartrate or stibophen. Incision and drainage was the therapeutic method employed in several cases. Other modes of treatment were injections of iodoform in and with fever. Since April 1938 the use of sulfonamide drugs has become routine for the treatment of lymphogranuloma venereum. Sulfadiazine seems to be less toxic than sulfathiazole. The sulfonamide drugs and bed rest constitute the best treatment at present for cases of acute genitoinguinal lymphogranuloma venereum. Surgical intervention in cases of early disease should be reduced to a minimum, it is stated.

Of the 254 patients to whom sulfonamide drugs were administered, 7 had severe reactions, mainly conjunctivitis. The period of hospitalization for 348 patients excluding the 40 patients with rectal involvement, averaged 21.5 days. The duration of hospitalization has been steadily decreasing since the advent of the sulfonamides. In the entire series, there were 32 cases with readmission in the 10-year period. Three deaths occurred in the series. Reports of 6 unusual cases are presented in detail.

In conclusion, the authors emphasize that patients with lymphogranuloma venereum should have a proctoscopic examination as soon as the diagnosis is established and periodic examinations to ascertain the existence of anorectal disease. In all cases of prolonged obscure rectal complaints there should be an intradermal test with Frei antigen and a proctoscopic examination. Patients who have lymphogranuloma venereum with rect

ment should receive a course of treatment with the sulfonamide drugs before operation is performed.

**B. H. OPHTH., CHICAGO**

Danger of penicillin therapy in active uveitis. Elton R. Yasuna. 37: 598-607, May 1947.

Surgical treatment of syphilitic primary atrophy of the optic nerves [syphilitic optochiasmatic arachnoiditis.] A clinico-anatomic study. Walter L. Bruetsch. 38: 735-754, Dec. 1947.

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**IT. M. J., LONDON**

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**BULL. NEW YORK ACAD. MED., NEW YORK**  
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**BULL. SANITAIRE, MONTREAL**

Extracts from the Act for the Prevention of Venereal Diseases. 48: 17-20, Jan.-Feb. 1948.

**BULL. U. S. ARMY M. DEPT., WASHINGTON**

\*Studies on gonococcal and nongonococcal urethritis among troops in the Pacific Theater. News and Comment. 7: 660-661, Aug. 1947.

Phenylarsenoxide in the prevention of syphilis and gonorrhea. News and Comments. 8: 96-97, Feb. 1948.

**Studies on gonococcal and nongonococcal urethritis among troops in the Pacific Theater. News and Comment. Bull. U. S. Army M. Dept., 7: 660-661, 1947.**

Three venereal disease studies carried out among Army troops in the Pacific Theater are reported in this article.

A survey made in September 1946 in the Philippines reveals results of penicillin treatment of gonococcal urethritis in 8,205 patients. Of these, 756 failed to be cured with a single course of penicillin, and after a second course of the drug only 226 of this number returned to duty. The remaining 530 patients received additional intensive penicillin and sulfonamide therapy, with 112 more eventually returning to duty. Of the 418 patients allegedly resistant to penicillin, 216 were admitted to Letterman General Hospital where, after careful examination, 19 (9 percent) were found to have gonococcal infection and were cured with either 300,000 or 600,000 units of penicillin in peanut oil and beeswax. In vitro tests for sensitivity to penicillin of the strains of gonococci isolated from these patients showed that from 0.02 to 0.08 units of penicillin inhibited their growth. A diagnosis of nongonococcal urethritis was made in 112 (52 percent) of the patients in the group of 216, and in the remaining 85 (39 percent) no evidence of venereal disease was found.

A subsequent study of gonococcal and nongonococcal urethritis in approximately 2,000 troops within the Pacific Theater showed that 2.97 percent had gonococcal infection and that 12.4 percent had non-

gonococcal urethritis. Overdecolorization of the stain was blamed for the difficulty in differentiating between gram-negative and gram-positive organisms, which caused some error in the diagnosis of gonococcal urethritis.

Of approximately 100 patients alleged to have gonococcal infection and who failed to be cured with 300,000 units of penicillin, it is stated that: (1) 23 percent still had the infection; (2) 50 percent were diagnosed as having nongonococcal urethritis; and (3) the remainder were asymptomatic. It is also stated that in practically every instance in which the gonococcus could be detected there was strong justification for suspicion that there had been a reinfection.

Inspection of prophylactic stations in several of the larger units was made and rubber condoms were collected for testing. The results of the tests have not been completed.

#### CALIFORNIA'S HEALTH, SACRAMENTO

Prostitution still here—still spreading venereal disease. 5: 273, Nov. 30, 1947.

Four-week course arranged for Army V. D. investigators. 5: 274, Nov. 30, 1947.

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"Hypospray" airgun allows injections without pain. 5: 299, Jan. 15, 1948.

State, local agencies share mental health act funds. 5: 308, Jan. 31, 1948.

Rights to detain alleged prostitutes upheld by court. 5: 314, Feb. 15, 1948.

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#### CANAD. J. PUB. HEALTH, TORONTO

Statistical studies in venereal disease control. W. G. Brown and W. B. Nichols. 38: 528-538, Nov. 1947.

A twenty-four hour medium for isolation of *Neisseria gonorrhoeae*. C. W. Christensen and H. W. Schoenlein. [Abstract of paper presented at the fifteenth annual Christmas meeting of the laboratory section, Canadian Public Health Association, Royal York Hotel, Toronto, Dec. 15-16, 1947.] 39: 74, Feb. 1948.

#### CANAD. M. A. J., MONTREAL

Report of the Committee on Public Health. The seventy-eighth annual meeting of the Canadian Medical Association, held in Winnipeg, June 23, 24, 25, 26, 27, 1947. 57: Supplement, 187-214, Sept. 1947.

An evaluation of various forms of therapy in early syphilis. Frederick Kalz and Barbara Dean. 57: 221-227, Sept. 1947. Recent advances in dermatology. Har

Orr. 57: 436-441, Nov. 1947. Recent advances in dermatology and syphilology. Louis A. Brunsting. 58: 137, Feb. 1948.

#### CANAD. NURSE, MONTREAL

New methods of treatment for venereal disease—gonorrhea. B. D. B. Layton. 45: 526-531, July 1947.

#### CANADA'S HEALTH & WELFARE, OTTAWA

Health on celluloid. (Films on v. d.) 4-5, Feb. 1948.

#### CHRIST HOSP. M. BULL., CINCINNATI

Dilatation type aortic hiatus aneurysm. case report. Ralph S. Grace and Geo. A. De Stefano. 1: 82-96, Jan. 1948.

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The effectiveness of the venereal disease control program in Connecticut. William Benedict. 62: 3-5, Jan. 1948.

#### FLORIDA HEALTH NOTES, JACKSONVILLE

Venereal disease control in Florida. R. Sondag. 40: 27, Feb. 1948.

A visit to the rapid treatment center. Russell Stuart Allen. 40: 29-43, Feb. 1948.

#### GEORGIA'S HEALTH, HAPEVILLE

VD menaces Georgia. 28: 1, 4, Jan. 1948. 100 mothers with syphilis. 99 babies born free from disease. 28: 3, Feb. 1948.

#### HEALTH, TORONTO

The diseases of middle age—arthritis—the great mystery. Wallace Graham. 111, 33, Mar.-Apr. 1947.

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A student nurse looks at public health. Lelon Lambe. 63: 7-9, Feb. 1948.

#### ILLINOIS M. J., OAK PARK

The present status of penicillin in dermatology—A resumé. Norbert C. Barwasser. 93: 31-38, Jan. 1948.

#### INDIAN J. VEN. DIS., BOMBAY

Gonorrhoea as treated by pyrexia induced by peptone. A protein split product. Nand Lal Bajaj. 13: 50-53, Oct.-Dec. 1947.

Arsenical encephalopathy. C. P. Cheriya. 13: 54-55, Oct.-Dec. 1947.

Prevention of venereal disease with special reference to Delhi. Nand Lal Bajaj. 13: 64-67, Oct.-Dec. 1947.



erological technique [cont'd.] S. D. S. Greval. 82: 202-203, Apr.; 265-269, May; 385-389, July; 455-458, Aug.; 534-536, Sept.; 1947.

J. A. M. A., CHICAGO

Streptomycin in the therapy of granuloma inguinale. Herbert S. Kupperman, R. B. Greenblatt and R. B. Dienst. 136: 84-89, Jan. 10, 1948.

Retreatment of syphilis during pregnancy. Queries and Minor Notes. 136: 146, Jan. 10, 1948.

Monococcic meningitis fifteen years after urethritis. Stephen L. Stigler and James S. McLester. 136: 919-920, Apr. 3, 1948. Venereal disease in the Army. Oslo. Foreign Letters. 136: 999, Apr. 10, 1948.

**Streptomycin in the therapy of granuloma inguinale.** Herbert S. Kupperman, R. B. Greenblatt and R. B. Dienst. J. A. M. A., 136: 84-89, 1948.

The authors used streptomycin with favorable results in the management of granuloma inguinale. A total of 91 patients was treated with streptomycin in sterile distilled water containing 25 to 30 percent of a 1-percent solution of procaine hydrochloride. Empirically judged doses varying from 3.3 gm. to 60 gm. were given in divided doses every 4 hours over intervals ranging from 5 to 62 days. In later stages of this study, however, a daily dose of 4 gm. was given for 5 days. This schedule was adopted for rapidity and effectiveness and the maintenance of high levels of streptomycin in the blood, thereby preventing the development of refractiveness.

One patient of the 51 receiving 4 gm. of streptomycin daily for 5 days had a recurrence of lesions, which healed upon retreatment. Thirty-two patients received 2 gm. or less per day for a period averaging 20 days. Of the 8 of these patients who relapsed, 7 were re-treated, 5 of these successfully. The other 2 became streptomycin resistant, the authors claim. Seven patients were given a daily dose of 4 gm. for more than 5 days, up to 10 days, with no relapses detected during the period of observation. One patient was treated successfully with streptomycin vaginal suppositories alone, 4 gm. daily for 4 days.

Toxicity was limited to the development of pruritus in four patients, one of whom showed a vesicular perioral dermatitis; a fifth patient had a burning sensation of the conjunctiva. The four pruritus patients were treated with 50 mg. of diphenhydramine hydrochloride given twice daily. This drug controlled the pruritus in three patients. The dermatitis patient failed to respond to the treatment; administration of streptomycin was discontinued in this instance. Use of the drug was suspended for 4 days for the patient with the conjunctival burning, and resumption of streptomycin injections produced no ill effects. No involvement of the eighth nerve was detected in any of the patients.

The antibiotic apparently disintegrates the Donovan bodies, the authors state. Negative smears were obtained within 2 to 11 days after initiation of the injections. Patients receiving 20 gm. of streptomycin over 5 days still had granulomatous lesions at the conclusion of therapy; within the next 8 to 12 days these lesions healed completely. Some healing and alleviation of pain and discomfort were brought about within 24 to 48 hours of the start of treatment.

The greatest economy and effect were found at a dose of 4 gm. daily for 5 days. The authors conclude that streptomycin gives hope of being the most effective drug in the management of granuloma inguinale; they believe that longer periods of posttreatment observation will bear out this conclusion.

J. AM. PHARM. A. (SCIENT. ED.), WASHINGTON

The estimation of penicillin K in commercial penicillin. William W. Wright and Donald C. Grove. 37: 115-117, Mar. 1948.

J. BACT. BALTIMORE

The reductase method for the determination of penicillin concentrations in body fluids. Roger D. Reid and John H. Brewer. 52: 251-254, Aug. 1946.

Studies on the production of antibiotics by actinomycetes and molds. R. L. Emerson, Alma J. Whiffen, Nester Bohonos and C. DeBoer. 52: 357-366, Sept. 1946.

On the isolation from agar of an inhibitor for *Neisseria gonorrhoeae*. Herbert L.

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- The effect of impurities on the chemotherapeutic action of crystalline penicillin. Gladys L. Hobby, Tulita F. Lenert and Beverly Hyman. 54: 305-323, Sept. 1947.
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- The effects of salts on streptomycin and dihydrostreptomycin in agar plate assays. S. F. Quan. 55: 25-26, Jan. 1948.
- A simple medium for identification and maintenance of the gonococcus and other bacteria. Harriette D. Vera. 55: 531-536, Apr. 1948.
- J. CLIN. INVESTIGATION, LANCASTER**
- The renal clearance of penicillins F, G, K, and X in rabbits and man. Harry Eagle and Elliot Newman. 26: 903-918, Sept. 1947.
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- J. FLORIDA M. A., JACKSONVILLE**
- Management of heart disease. [Including syphilis.] C. Frederic Roche. 34: 509-512, Mar. 1948.
- J. INDIAN M. A., CALCUTTA**
- The role of gonorrhoea in chronic prostatitis. M. A. H. Siddiqui. 17: 33-36, Nov. 1947.
- Indian Medical Mission in Indonesia. Current Topics. 17: 49-54, Nov. 1947.
- J. INDIANA M. A., INDIANAPOLIS**
- Penicillin in infectious syphilis. Herbert L. Joseph, Gerald F. Kempf and George W. Bowman. 40: 1232-1234, Dec. 1947.
- Venereal disease. Society Reports. 40: 1283, Dec. 1947.
- Quantitative serology and syphilis. Part II. The role of quantitative serologic tests in the diagnosis of syphilis. Carl C. Kuehn and Samuel R. Damon. 41: 424-425, Apr. 1948.
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- Venereal disease. Committee Reports. 49: 180, 182, Apr. 1948.
- J. M. SOC. NEW JERSEY, ORANGE**
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- Discontinuance of State gonococcus culture laboratory. New Jersey State Department of Health. Public Health News the Physician. 45: 42, Jan. 1948.
- Find the missing million. New Jersey State Department of Health. Public Health News for the Physician. 45: 89, Feb. 1948.
- J. OKLAHOMA M. A., OKLAHOMA CITY**
- Report of the Committee on Conservation of Health. [Venereal disease incidence.] Committee Reports. 41: 160, Apr. 1947.
- J. PATH. & BACT., EDINBURGH**
- The sensitivity of organisms of the genus *Leptospira* to penicillin and streptomycin. J. A. H. Wylie and E. Vincent. 59: 254, Jan.-Apr. 1947.
- J. ROY. ARMY M. CORPS, LONDON**
- Tabes dorsalis, aortic aneurism, and cutaneous syphilis presenting in the same patient. J. W. Eames. Clinical and Otological Notes. 89: 301-303, Dec. 1947.
- J. ROY. SAN. INST., LONDON**
- Venereal diseases—past, present, and future. Richard M. Warren. 67: 585-590, Nov. 1947.
- J. SOCIAL HYG., NEW YORK**
- \*International aspects of the venereal disease problem. Thorstein Guthe and John C. Hume. 34: 51-95, Feb. 1948.
- International aspects of the venereal disease problem.** Thorstein Guthe and John C. Hume. *J. Social Hyg.*, 34: 51-95, 1948.
- The authors present the various facets of the venereal disease problem and offer suggestions for dealing internationally with it.
- Already-existing venereal disease difficulties are intensified by war, the authors state, as was shown in the recent war. With increased mobility of populations, the epidemiologic significance of venereal diseases is evident. Morbidity and mortality reports from the various countries must be coordinated and must be accurate in order that proper evaluations can be made of the incidence of venereal disease and of the success of control programs.
- Syphilis is regarded as the best indicator of the status of venereal disease in the various nations. If one uses a figure of 100-200 new syphilis cases yearly per 100,000 population (approximately the discovered incidence for 1946 in Finland and Denmark) to determine the number

newly acquired cases in the world population of 2,000,000,000, one arrives at an estimate of 2,000,000 to 4,000,000. Applying the ratio of 1 syphilis case to 3 gonorrhea cases, the figure for gonorrhea is estimated at 6,000,000 to 12,000,000 new cases yearly. A prevalence rate of 2 per cent for syphilis indicates a total of 400,000 cases.

Much emphasis is laid on the relation between socioeconomic problems and venereal disease incidence. The authors point to investigations which suggest a relation between a deteriorating economy and a rising venereal disease rate.

The long-range approach to venereal disease control should be made through planned, coordinated sociologic and economic endeavors, in addition to medical and related scientific programs, the authors feel. Action by the World Health Organization should be in accord with programs of other appropriate agencies of the United Nations. Specific world plans for venereal disease control should be prepared by an international commission for venereal diseases, with representation from the WHO and other international agencies interested in the subject.

Regarding international efforts to control venereal disease, three main purposes have been served: Exchange of professional information; collection and dissemination of clinical, administrative, and scientific venereal disease information, including coordination of research in serology and the standardization of antisyphilitic drugs; control of the spread of venereal disease via communication routes, including maritime services. Of the various efforts, the Brussels Agreement of 1924 is the most specific international antivenereal disease document.

The authors agree with Heller and Von derlehr that any international effort to combat venereal disease must include the following minimal conditions: An international section in all national health departments; a universal system of approved laboratory services; a global clinic and hospital system; headquarters for the exchange of information; educational and promotional services.

Eventually suitable international venereal disease control activities would include the following: Establishment of uniform reporting systems; distribution of information concerning national venereal disease campaigns and their effects; establishment of uniform administrative and scientific standards; evaluations of control programs; evaluation of venereal disease in relation to other problems, e. g., social welfare, promiscuity, and prostitution; promotion of scientific research; dissemination of professional and public information; and the summoning of international control conferences.

The authors make further recommendations for international methods of dealing with venereal disease. They stress the point that the most urgent problems must receive primary consideration by the World Health Organization.

#### JOURNAL-LANCET, MINNEAPOLIS

Clinical use of antibiotics with special reference to penicillin and streptomycin. Wallace E. Herrell. 68: 6-9, Jan. 1948.

#### LANCET, LONDON

A more sensitive Wassermann reaction. Notes and News. 1: 732, May 24, 1947.

Present position of penicillin. Special Articles. 2: 483-484, Sept. 27, 1947.

The viability of *Treponema pallidum*. C. E. Lumsden and M. B. Aberd. 2: 827-829, Dec. 6, 1947.

Viability of *Treponema pallidum*. Letters to the Editor. L. W. Harrison. 2: 964, Dec. 27, 1947.

#### M. OFFICER, LONDON

Venereal disease. Parliament and Public Health. 79: 8, Jan. 3, 1948.

Venereal diseases. Notes and Comments. 79: 22-23, Jan. 17, 1948.

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International measures against venereal disease. 79: 76, Feb. 21, 1948.

V. D. in-patients. Hospital Services. 79: 81, Feb. 21, 1948.

Venereal disease in Royal Navy. Parliament and Public Health. 79: 94, Feb. 28, 1948.

V. D. contacts. Notes of the Week. 79: 146, Apr. 3, 1948.

#### MEMPHIS M. J., MEMPHIS

\*Penicillin and penicillin-malaria in the treatment of neurosyphilis. Henry Packer and Y. T. Wong. 33: 62-67, Apr. 1948.



**Penicillin and penicillin-malaria in the treatment of neurosyphilis.** Henry Packer and Y. T. Wong. Memphis M. J., 33: 62-67, 1948.

This report is a preliminary comparison of the results of administering penicillin, alone or with malaria, to 225 neurosyphilis patients. Sodium penicillin was given intramuscularly in isotonic saline solution every 3 hours. In the penicillin-malaria group, the antibiotic was given during the fever.

A group of 46 dementia paralytica patients was divided into 2 groups of 23. One type of therapy was given each group. Almost all patients had the paretic formula in their spinal fluid. The average amount of penicillin given was 5,990,000 units for the penicillin group and 5,740,000 for the penicillin-malaria group, over an average period of 21.8 days for both groups.

Six months after treatment, the average spinal fluid cell count was below 9 in 94 percent of the penicillin group and in 93 percent of the combined group; it was below 4 in 83 percent of the former group and in 86 percent of the latter. Average protein values per 100 cc. spinal fluid were 47 mg. for the penicillin group and 48 mg. for the penicillin-malaria group. The differences between the groups in colloidal gold and quantitative Kolmer tests at the end of 6 months were not statistically significant. The percentages of patients showing 50 percent or more clinical improvement (based on quartile percentages used by the University of Pennsylvania Penicillin-Syphilis Study Group) were 74 and 78 for the penicillin and penicillin-malaria groups, respectively. An evaluation was made of those patients who received 5,000,000 units of penicillin, alone or with a minimum of 30 hours of fever. No significant difference was seen in the percentage of clinical improvement shown (63 percent for the penicillin-malaria group, 62 percent for the penicillin group). The five relapses seen were attributed to inadequate amounts of the drug. The authors feel that 6,000,000 units of penicillin without malaria is the preferred treatment for dementia para-

lytica. Lack of response within 3 months calls for a repeated course of the antibiotic. A second failure may necessitate use of the combined therapy.

A group of 30 patients with tabes dorsalis was studied; 15 received penicillin alone, with an average of 6,200,000 units given, and 15 received the combined therapy, with an average of 5,250,000 units of penicillin given. The authors feel that penicillin alone is very efficacious in treatment of tabes, except in patients with severe gastric crisis and rapidly progressing optic atrophy; in such patients, they advise the use of penicillin-malaria.

Twenty-nine patients with meningovascular syphilis were treated with penicillin alone and 18 with penicillin-malaria. The average quantity of penicillin given was 5,900,000 units for the penicillin group and 4,800,000 units for the penicillin-malaria group. The authors state that penicillin alone is the first choice in meningovascular syphilis.

Thirty patients with optic atrophy were divided into equal-sized groups, 15 receiving an average of 6,900,000 units of penicillin alone, the other receiving 4,200,000 units plus fever. The authors believe that rapidly progressing cases of optic atrophy should be given penicillin-malaria, but penicillin alone is thought to be adequate for early cases.

Eleven patients with congenital paretic syphilis were studied, five receiving penicillin alone and six receiving penicillin-malaria. No significant difference was seen in cerebrospinal fluid results. The authors advocate penicillin-malaria for patients with interstitial keratitis; they feel that penicillin alone is adequate for patients showing keratitis.

Eleven asymptomatic neurosyphilis patients were treated with penicillin alone and seven with penicillin-malaria. The authors feel that the response to penicillin alone was satisfactory.

If time bears out these conclusions, the authors believe that the use of malaria in the treatment of neurosyphilis will be decreased in the future.

**T. HYG., ALBANY**

venereal-disease anxiety. Morris, A. Wessel and Bernard D. Pinck. 31: 636-646, Oct. 1947.

Primary venereal-disease rate hits new low since V-J day. Notes and Comments. 31: 688-689, Oct. 1947.

**MICHIGAN PUB. HEALTH, LANSING**

Some fundamentals in venereal disease control. John A. Cowan. 35: 27-28, Feb. 1947.

Primary venereal disease. 35: 79, Apr. 1947.  
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Upward trend in venereal disease reached peak in '46. 35: 162, Aug. 1947.

Could you believe it. [Venereal disease.] 36: 30, Feb. 1948.

**U. S. SURGEON, WASHINGTON**

Study of military prisoners at a disciplinary barracks suspected of homosexual activities. [Venereal disease.] David M. Wayne, M. Adams and Lillian A. Rowe. 101: 499-504, Dec. 1947.

**NEW ENGLAND J. MED., BOSTON**

Syphilis. Medical progress. G. Marshall Crawford. 238: 87-93, Jan. 15, 1948; 121-128, Jan. 22, 1948; and 152-159, Jan. 29, 1948.

Neostarsenical encephalopathy in the treatment of syphilis in women. S. Charles Kasdon and Morris W. Shapiro. 238: 282-288, Feb. 26, 1948.

The incidence of multiple lesions in primary syphilis. Ivan W. Kuhl and Hunter Boggs. 238: 399-400, Mar. 18, 1948.

**The incidence of multiple lesions in primary syphilis.** Ivan W. Kuhl and Hunter Boggs. New England J. Med., 238: 399-400, 1948.

The authors present results of a study which contradicts the general impression that multiple lesions in primary syphilis are rare.

The study was made at Kanawha Valley Medical Center and covers the period January 1 to December 31, 1946. Admissions to the Center included 2,023 patients with primary and secondary syphilis, 742 with early latent syphilis, and 718 in later stages. In an effort to determine whether multiple lesions were definitely due to secondary syphilis, the authors studied separately all untreated, seronegative, darkfield-positive cases. This was done in accordance with the general assumption that more than 98 percent of

all cases of secondary syphilis have positive serologic tests. Thus, there was an unselected series of cases that were clinically primary syphilis and a selected series of cases that were still in the seronegative phase.

In the unselected cases of primary syphilis, the chancres were single in 378 (58 percent), multiple in 251 (38.5 percent), and indeterminate in 23 (3.5 percent). In the selected seronegative cases of primary syphilis, the lesions were single in 107 (56.3 percent), multiple in 82 (43.2 percent), and indeterminate in 1 (0.5 percent). In the entire series of primary cases, there were reinfections in 24, monorecidence relapses in 16, and extragenital lesions in 10. The authors observed only 1 case of multiple extragenital lesions—so-called "kissing lesions" of the lips. Many extragenital primary lesions were observed, but the majority of patients were admitted in the secondary stage.

Three tables present statistical data on sex incidence in the cases of primary syphilis. Of all persons seen, 51.8 percent were male patients. In the unselected series of primary cases, 87.3 percent were male, and in the selected series, 93.2 percent were male, which would indicate not only that more male patients seek treatment in the primary stage but also that in the earliest diagnosed stage of syphilis the preponderance of the male is even greater. Despite this preponderance of males, however, the percentage of multiple lesions was consistent in both series, and the authors conclude that there seems to be no tendency for one sex to have multiple primary lesions more frequently than the other.

**NEW MEXICO HEALTH OFFICER, SANTA FE**

Twenty-five years of public health in New Mexico. (1919-1944.) 12: 1-81, Dec. 1944.

**NEW ORLEANS M. & S. J., NEW ORLEANS**

Chemotherapy and antibiotics. Symposium. Maxwell Finland. 100: 345-358, Feb. 1948.

**NEW YORK STATE J. MED., NEW YORK**

Allergic reaction to penicillin. Maxwell L. Gelfand. 47: 2707-2708, Dec. 15, 1947.

## CURRENT NOTES AND REPORTS

### Venereology for Nurses

A thoroughly revised textbook for nurses is now available. This is the fourth edition of *Dermatology and Venereology for Nurses*, (Philadelphia, 1948, pp. 416) by Dr. John H. Stokes and Jane Barbara Taylor, R. N., of the Institute for the Study of Venereal Disease, University of Pennsylvania. The book is addressed to nurses—as students in training, as practitioners, and as women

of intelligence and civic initiative. The work is divided into four parts: (1) a descriptive summary of diseases of skin, (2) the special management of skin diseases, (3) the venereal diseases, and (4) the background of the venereal disease problem in the principles of social hygiene. The book is well illustrated and includes an appendix, glossary, and index.

### Consultation Service for Physicians

At Ann Arbor, the Michigan Rapid Treatment Center for venereal disease, which has treated more than 10,000 venereal disease patients referred from practicing physicians and clinics during the past 4 years, is now offering an additional service.

The Center, operated by the Michigan Department of Health in cooperation with the United States Public Health Service, now provides a consultation service of special benefit to physicians and patients in isolated or rural areas of the State. Any practicing physician in the State may send his patient to the Center for diagnosis of syphilis or the stage of syphilis, and for recommendations for treatment.

The patient is then returned to the physician for necessary treatment.

Advantages of the new service are many. It affords consultation not otherwise readily available in many sections of the State. It will make it possible for more infected persons to be diagnosed and will provide more complete individual diagnosis. It will allow the patient to be treated by his own physician in his own locality.

The Rapid Treatment Center, which is now admitting about 200 patients a month for treatment, has a medical officer in charge and, normally, three resident physicians. The consultation service will afford the benefit of their specialized knowledge to a greater share of the State population.

### Radio Broadcast

The ABC venereal disease documentary broadcast, heard coast-to-coast during the week of April 29, polled more than 500 letters in the first 3 days following the broadcast, and only one of these letters expressed adverse comment. Hearty congratulations are due the American

Broadcasting Company for their cooperation and the high artistic quality of the program.

Arrangements are now being made to purchase 100 pressings of the broadcast for free distribution to health agencies through Public Health Service district offices.



## Refresher Serologic Training Courses

Refresher training courses in the laboratory practices of serology of syphilis, being conducted at the Venereal Disease Research Laboratory, in Staten Island, N. Y., will be discontinued for the months of July and August. Arrangements for classes this autumn will be influenced by the number of applications received.

The refresher training includes discussion, demonstration, and practice of flocculation and complement-fixation tests for syphilis in accordance with the most recently accepted technics for each test. Other procedures using cardiolipin-lectin antigens are included in this category.

Classes have been scheduled at 2-week intervals, but arrangements may also be

made for those workers desiring to spend additional time on selected procedures. A third week or longer may be used to review other spinal fluid testing procedures.

There are no tuition or laboratory fees. Class participants must bear the expense of room accommodations and meals. Hotel reservations should be made prior to arrival in New York City.

These courses were primarily designed for technicians employed in the serology section of State or public health laboratories in this hemisphere, but applications from other qualified workers will be considered. Applications for registration should be forwarded to The Director, Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island 4, N. Y.

## Case-Finding Project in Santa Clara County, California

A venereal disease case-finding demonstration is under way in Santa Clara County, Calif. The sponsors of the project are the health departments of Palo Alto City, and of Santa Clara County; the Santa Clara County Medical Society; the California Department of Public Health; and the United States Public Health Service.

The major purposes of the study are:

To demonstrate that the strengthening of the relationship between the private physician and the health department, as an essential of a sound venereal disease control program and upon a continuing basis, will result in increased activity by private physicians in diagnosis, treatment, and epidemiology.

2. To demonstrate that a public information program, integrated with the general health education program and upon a continuing basis, will result in accelerated case-finding for both the private physician and the health department.

As one phase of the program, health department nurses are regularly visiting private physicians in the county to enlist their cooperation in venereal disease control and to acquaint them with the range and kind of services which the health departments can offer them. As another part of the project, a public information campaign, involving the use of both mass mediums and special group education, is coordinated with the physician-relation aspects and with the total health education program.

# STATISTICS

## First Admissions to State Hospitals <sup>a</sup> for Psychoses Due to Syphilis, United States and Each State, 1945

Region and State	Number of first admissions			Rates per 100,000 civilian population			Psych due to syphilis, hundred first admissions for psych
	Paresis	Other syphilis of the central nervous system	Total psychoses due to syphilis	Paresis	Other syphilis of the central nervous system	Total psychoses due to syphilis	
United States <sup>b</sup> .....	5,660	796	6,456	4.5	0.6	5.1	
New England.....	171	26	197	2.1	.3	2.4	
Maine.....	12	5	17	1.5	.6	2.1	
New Hampshire.....	16	1	17	3.5	.2	3.7	
Vermont.....	6	0	6	1.8	0	1.8	
Massachusetts.....	72	13	85	1.8	.3	2.1	
Rhode Island.....	18	1	19	2.7	.1	2.8	
Connecticut.....	47	6	53	2.6	.3	3.0	
Middle Atlantic.....	1,128	166	1,294	4.4	.6	5.0	
New York.....	635	95	730	5.0	.8	5.8	
New Jersey.....	122	24	146	3.2	.6	3.8	
Pennsylvania.....	371	47	418	4.0	.5	4.5	
East North Central.....	1,398	137	1,535	5.4	.5	5.9	
Ohio.....	482	30	512	7.1	.4	7.5	
Indiana.....	182	15	197	5.3	.4	5.7	
Illinois.....	462	52	514	6.3	.7	7.0	
Michigan.....	238	37	275	4.3	.7	5.0	
Wisconsin.....	34	3	37	1.2	.1	1.3	
West North Central.....	320	61	381	2.6	.5	3.1	
Minnesota.....	45	19	64	1.7	.7	2.4	
Iowa.....	49	16	65	2.1	.7	2.7	
Missouri.....	145	5	150	4.2	.1	4.3	
North Dakota.....	2	1	3	.4	.2	.6	
South Dakota.....	11	2	13	2.1	.4	2.5	
Nebraska.....	25	2	27	2.1	.2	2.3	
Kansas.....	43	16	59	2.5	.9	3.5	
South Atlantic.....	1,096	124	1,220	6.3	.7	7.0	
Delaware.....	21	1	22	7.9	.4	8.3	
Maryland.....	130	10	140	6.8	.5	7.3	
District of Columbia <sup>c</sup> .....	87	13	100	10.6	1.6	12.1	
Virginia.....	164	22	186	6.2	.8	7.0	
West Virginia.....	103	41	144	6.1	2.4	8.5	
North Carolina.....	109	26	135	3.3	.8	4.0	
South Carolina.....	120	3	123	6.7	.2	6.8	
Georgia.....	219	0	219	7.7	0	7.7	
Florida.....	143	8	151	7.2	.4	7.6	
East South Central.....	398	95	493	4.0	1.0	4.9	
Kentucky.....	167	1	168	6.6	0	6.6	
Tennessee.....	73	12	85	2.6	.4	3.1	
Alabama.....	55	60	115	2.1	2.3	4.4	
Mississippi.....	103	22	125	5.1	1.1	6.1	
West South Central.....	572	84	656	4.6	.7	5.3	
Arkansas.....	94	14	108	5.3	.8	6.0	
Louisiana.....	143	15	158	6.3	.7	6.9	
Oklahoma.....	120	41	161	5.9	2.0	7.9	
Texas.....	215	14	229	3.4	.2	3.7	
Mountain <sup>b</sup> .....	56	40	96	2.0	1.4	3.4	
Montana <sup>b</sup> .....	(17)	(4)	(21)	(3.1)	(.7)	(3.8)	
Idaho.....	4	6	10	.9	1.3	2.2	
Wyoming.....	0	11	11	0	4.7	4.7	
Colorado.....	18	2	20	1.8	.2	2.0	
New Mexico <sup>b</sup> .....	(14)	(5)	(19)	(2.7)	(1.0)	(3.7)	(1)
Arizona.....	20	19	39	3.7	3.5	7.2	
Utah.....	14	2	16	2.4	.3	2.8	
Nevada <sup>b</sup> .....	(2)	(15)	(17)	(1.6)	(12.0)	(13.6)	(2)

See footnotes at end of table.

First Admissions to State Hospitals <sup>a</sup> for Psychosis Due to Syphilis, United States and Each State, 1945—Continued

Region and State	Number of first admissions			Rates per 100,000 civilian population			Psychoses due to syphilis per hundred first admissions for all psychoses
	Paresis	Other syphilis of the central nervous system	Total psychoses due to syphilis	Paresis	Other syphilis of the central nervous system	Total psychoses due to syphilis	
Alc.....	521	63	584	4.4	.5	5.0	7.3
Washington.....	66	20	86	3.3	1.0	4.2	5.6
Oregon.....	28	8	36	2.1	.6	2.8	4.1
California.....	427	35	462	5.1	.4	5.5	8.2

<sup>a</sup>Figures include 2 Federal hospitals—St. Elizabeths Hospital, Washington, D. C., and Morningside Hospital, Oregon.  
 United States and Mountain Region totals exclude Montana, New Mexico, and Nevada, for which 1945 data on psychosis are not available. Data shown for these States are from the last complete reports: Montana, 1941; New Mexico and Nevada, 1942.  
 Includes St. Elizabeths Hospital (Federal).  
 Includes Morningside Hospital (privately owned but hospitalizing the mentally diseased of Alaska for the Federal Government).  
 Source: Bureau of the Census: Current Population Report, P-25, No. 2; Patients in Mental Institutions, 1945.  
 S.P.H.S.—Venereal Disease Division, Office of Statistics 5/12/48 (LPW-NF-FD)







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August 1948

Number 8

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FEDERAL SECURITY AGENCY  
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### **Submission of Manuscripts**

In order to facilitate the handling of manuscripts submitted for publication in the JOURNAL OF VENEREAL DISEASE INFORMATION, the editor requests that copy be prepared in triplicate, typewritten, double-spaced, with liberal margins. Statistical tables and charts should be set up according to the style used in the JOURNAL, and should be presented on separate sheets, rather than within text material.

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**Approved by the Director, Bureau of the Budget, as required by  
Rule 42 of the Joint Committee on Printing**



**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office  
Washington 25, D. C. - Price 10 cents. Subscription Price: Domestic, 75 cents  
a year; foreign \$1.15**



# Venereal Disease Information Among Patients

R. C. Sexton, Jr., M. D., Chief Medical Officer  
East Tennessee Medical Center, Chattanooga, Tenn.

During the past few months 1,000 patients at the East Tennessee Medical Center have been asked to fill out a questionnaire. The objectives of this questionnaire were fivefold:

1. To determine insofar as possible the patient's initial source of information about venereal disease.
2. To determine the incident, symptoms, or fact which caused the patient to suspect that he had a venereal infection.
3. To assess the different avenues through which the patients became aware of the Medical Center and its services.
4. To assess the role of the private physician in venereal disease control.
5. To evaluate the efficacy of the more commonly employed educational procedures at this rapid treatment center.

## Procedure

The patients were asked to fill out the questionnaire the day before their discharge from the Medical Center. The participants were syphilitics in all diagnostic categories. No attempt was made to select the patients.

An explanation of the questionnaire, with instructions as to filling it out, was given by one of the medical officers. The purpose of the study was also discussed. The patient was urged to be perfectly frank and honest, and he was assured that the information supplied would not be detrimental to him. If a patient was illiterate, the questionnaire was read to him and his answers were written in by a nurse.

## Analysis of Results

### Initial Information

The role of gossip and friendly discussion in disseminating information about venereal disease remains potent. About 23 percent of the patients acquired their initial information in this manner.

Approximately 8 percent of the patients received their initial information at school, and another 8 percent received initial information from parents. This indicates, as we expected, that too little effort is being exerted where most can be expected in the way of results. Receptiveness of the youthful mind, respect for parental counsel, and the prophylactic value of an early approach justify more emphasis among these two groups.

Thirteen percent of the patients stated that their initial information was gained while in the armed forces. Since about 50 percent of our patients are females and many of the patients were not in the armed forces because of physical disability or age exemption, it is believed that this percentage reflects a good result from the educational efforts of the armed forces.

The role of posters, pamphlets, newspapers, and radio talks on venereal diseases was not too important. Of these four technics, pamphlets were most effective, with 3 percent of the patients mentioning them as the source of information.

The physician was the dominant source of initial information in the group (38.9 percent of the patients). Unfortunately, most of the information is conveyed by the physician after the infection is acquired, and many of the diagnoses on these patients are made on the basis of blood serologic tests rather than on the basis of lesions.

# Questionnaire

Tabulation of  
patients' answers  
Number    Percent

## 1. How did you first learn about venereal disease?

From a doctor-----	389	38.
From a friend or friends-----	233	23.
While in Army or Navy-----	131	13.
From parents-----	85	8.
From school-----	80	8.
From pamphlets on venereal disease-----	33	3.
From posters on venereal disease-----	13	1.
Heard about venereal disease over radio-----	6	.
From newspapers-----	2	.
Others -----	28	2.
	1, 000	100.

## 2. How did you find out or become suspicious that you had a venereal disease?

Noted the appearance of sores or a rash which I thought might be due to venereal disease-----	365	36.
Had a blood test to get a health card-----	135	13.
Had a blood test where I am working or had a blood test as part of the examination to go to work for a concern-----	130	13.
Received a letter from the health department or was told by a representative of health department to report for examination and blood testing-----	94	9.
Had a blood test while I was in hospital for another disease-----	72	7.
Because of exposure to an individual whom I later found to have a venereal disease-----	62	6.
Was told by a friend who has been treated at the Medical Center that I might have a venereal disease-----	47	4.
Because an individual to whom I had been exposed advised me to have an examination-----	22	2.
Was told by a friend who has not been treated at the Medical Center that I might have a venereal disease-----	20	2.
Had a blood test in order to get married-----	19	1.
Others -----	34	3.
	1, 000	100.

## 3. How did you learn about the Medical Center?

From the health department or venereal disease clinic-----	613	61.
From a private physician-----	188	18.
From a friend or member of family who has been treated at this or another medical center-----	152	15.
From a friend or member of family who has not been treated at a medical center-----	38	3.
Others -----	9	.
	1, 000	100.

What has taught you most about venereal disease while at the Medical Center?

Talks by and with doctors and other members of staff-----	502	50.2
Motion pictures-----	406	40.6
Reading bulletins on venereal diseases-----	47	4.7
Talking with other patients-----	39	3.9
Others -----	6	.6
	1,000	100.0

### Initial Suspicion of Infection<sup>1</sup>

The appearance of symptoms or signs was responsible for about one-third of the patients first becoming suspicious that they had a venereal disease. Lesions or an eruption were noted by 36.5 percent of the patients.

Former Medical Center patients informed 4.7 percent of the 1,000 patients under study that they might have venereal disease. This figure contrasts favorably with the 2 percent who were informed that they probably had venereal disease by individuals who had not been treated at the Medical Center. It also indicates that there is less reluctance to discuss venereal disease infection than in former years.

Thirteen percent of the patients discovered their infection as a result of pre-employment or periodic serologic testing done routinely at their place of employment. This justifies the use of such serologic blood testing in industry, but at the same time it indicates that a fairly high percentage of syphilitics are not being found in the infectious stages of the disease. The significance of this technic of case finding is increased when it is realized that approximately 50 percent of our patients are females and that males made up most of this 13 percent.

The high incidence of patients reporting the application for a health card as

the means by which the infection was discovered is not surprising (13.5 percent). The low percentage of patients (1.9 percent) listing premarital blood testing, as the incident which brought the infection to light is not particularly significant. The percentage is probably reduced by the exodus of patients to States which do not require serologic testing as a prerequisite to marriage.

The significant role of general hospitals in case finding is illustrated by 7.2 percent of the 1,000 patients having discovered their infection as a result of serologic tests while in a general hospital for another illness. This, we believe, is further justification for routine serologic testing of all hospital admissions.

Six percent of the patients became aware of their infection because of exposure to an individual whom they later found to have a venereal disease. In many cases this knowledge was gained as a result of the initially infected partner informing his contact. Again this reflects a tendency toward less reluctance on the part of patients to discuss their infection.

The statement concerning receipt of a letter from the health department, or notice to report for examination, was designed to check the effectiveness of contact investigation by health department personnel. It is gratifying to see that 9 percent of the patients learned of their infection as a result of such epidemiologic activity, despite the fact that a majority of the health departments in Tennessee have neither a contact investigator nor a full-time director.

<sup>1</sup> EDITOR'S NOTE.—The reader may be interested in a statistical presentation of "Reasons for Coming to Venereal Disease Clinics for Diagnosis," in the June issue of the JOURNAL OF VENEREAL DISEASE INFORMATION, vol. 29: 190-191, 1948.



## **Knowledge of Medical Center**

The answers to question 3 disclose that the majority (61 percent) of the patients learned about the Medical Center from the health department or venereal disease clinic; and 18.8 percent learned about it from their private physicians.

Admission records to the Center during a 6-month period almost concomitant with the period during which these questionnaires were used, showed that 7 percent of our patients were referred directly to the Medical Center by private physicians. During the same period 4 percent of our patients were referred to us by private physicians through the health departments. Thus, private physicians were responsible either directly or indirectly for the admission of 11 percent of our patients.

It is also gratifying to note that 15 percent of the patients in this study learned about the Medical Center from a friend or a member of his or her family who had been treated at this or another medical center.

## **Education at the Medical Center**

Question 4 represents an attempt to evaluate the commonly used educational procedures. While at the East Tennessee Medical Center, patients are shown three motion pictures on venereal diseases and lantern slides which depict early lesions and the late hazards of venereal diseases. Individual patient education is given by the contact worker. A lecture is given for all patients by one of the medical officers. Each patient has an opportunity to talk with one of the medical officers the day before his discharge. During this interview, posttreatment follow-up, epidemiology, and the public health aspects of the disease are emphasized.

During the period that these questionnaires were used, the venereal disease comic book *Little Willie* was given to each patient, and copies of five different bulletins were placed on the wards weekly. Other more comprehensive bulletins were available to those who requested them.

No posters were used. As a result, 4 percent replied that they had learned most about venereal diseases by reading these bulletins.

It is interesting that, contrary to our expectations, 50 percent of the patients indicated that they had learned most about venereal diseases as a result of talks by and with medical officers and other members of the staff. Among the educational techniques used at the Medical Center, motion pictures were more important for 40.6 percent of these patients.

## **Conclusion**

One thousand syphilis patients at the East Tennessee Medical Center were asked to fill out a questionnaire which dealt with several aspects of our venereal disease problem. It is not believed that the results of this study reflect any new trends or necessarily new conclusions. The fact that many of the results are what we had anticipated tend to validate the study.

This study indicates that initial venereal disease information is most frequently obtained through physicians, friends, and the armed forces.

Suspicion regarding the presence of venereal infection is aroused most frequently by the appearance of lesions. The use of pre-employment and periodic serologic blood testing in industry is productive of a significant number of cases. The well-known fact that syphilis is endemic among food handlers is reaffirmed.

Most patients became aware of the Medical Center and its services by way of local health departments and venereal disease clinics, or through former Medical Center patients.

Private physicians participate in the admission of about 11 percent of our patients. Thirty-eight percent of the patients indicated that their initial information regarding venereal disease had been obtained from a private physician.

Of the commonly employed educational procedures within the Medical Center, motion pictures and talks to the patients are most effective.

# Differentials in the Process of Contact Investigation<sup>1</sup>

J. Wallace Rion, Biostatistician, and Albert P. Isk rant, Principal Statistician,  
United States Public Health Service

A previous paper in this series (1) has described the interrelations, found in an analysis of the contact investigation experience of a number of States, between the number of contacts named by patients, the percentage of these contacts located, the percentage of examined contacts found to be infected, and the over-all results of the process of contact investigation (as measured by the epidemiologic index).

This paper will describe, in part, the effect of race, sex, locality, and the relationship of patient to contact on the percentage of named contacts who are located and the percentage of examined contacts who are found to be infected with syphilis.

primary and secondary syphilis reported for investigation during a 6-month period, and the dispositions made on these contacts as of a date 60 days after the close of the 6-month period. The group classified as located contains all contacts brought to examination; the group classified as infected contains all contacts diagnosed as syphilitic, including persons diagnosed before the receipt of the contact report.

In the analyses by locality presented in this paper, we have made a division of the 19 reporting areas into three regional groupings: (a) the South, including 8 States lying in the Southeast and Southwest as outlined by Odum (2); (b) the

**Table 1.—Percentage of contacts of primary and secondary syphilis who were located, by race and sex of contact**

[19 areas: January to December 1946]

Area	Average percentage located				
	Total all contacts <sup>1</sup>	White		Nonwhite	
		Male	Female	Male	Female
South.....	54.4	53.3	53.5	56.9	56.3
Non-South.....	51.6	53.8	47.7	49.6	50.7
Large cities.....	47.4	47.3	40.6	48.6	47.1
All areas.....	51.2	51.9	48.3	52.4	52.1

<sup>1</sup> Includes race and sex not stated.

All the data considered are based on the investigation of the contacts of primary and secondary syphilis.

The information on which the present analysis is based consists of special epidemiologic evaluation reports received from 14 States and 5 large cities, covering the two 6-month periods in the calendar year 1946. These reports show, by race and sex, the total number of contacts of

non-South, including the other 6 States reporting; and (c) the five large cities.

## Percentage Located

The percentage of contacts, reported from these 19 areas during 1946, who were located, is shown in table 1, together with a break-down by race and sex.<sup>2</sup> It is

<sup>2</sup> For figures for individual States and cities, see the Statistical Letters prepared quarterly by the Venereal Disease Division, U. S. Public Health Service.

<sup>1</sup> From the Venereal Disease Division.

immediately apparent that in no area were all contacts located who were reported for investigation, and that the percentage of locations varied from one group of contacts to another.

In general, there are two reasons for variation in the percentage of locations in contact investigation: (a) the quality of information obtained by the interviewer, and (b) the degree of success in utilizing the information given. Considerations which affect the information entered on the contact report are the skill and persistence of the contact interviewer, the kinds and amount of information the patient possesses regarding the contact, the degree to which he can recall this information at the time of interview, and the cooperation he gives the interviewer. Whether the contact will be located and brought to examination then depends on the skill and perseverance of the investigator, and also on conditions which may make it more difficult to locate one contact than another, even though the identifying information given for each appears to be equally complete.

The present study indicates that these factors seem to result in a rate of location which varies from one group of contacts to another. It is not possible from this material, however, to assess the relative importance of each factor.

The regional grouping here used gives an approximate break-down into areas which are relatively homogenous as to rural-urban population characteristics.<sup>3</sup> The eight Southern States are more largely rural in population and in social behavior; the six States classified as non-Southern tend to more of an urban pattern; and the five large cities are, of course, wholly urban in character. Table 1 shows that this rough approximation to rural-urban division indicates a higher percentage of location in rural areas, not

only in the total of all contacts but also in general in each race-sex group. A study of the correlation between the percentage of the population in each area which is classified as urban and the percentage of contacts located supports this conclusion, although the relationship is much less pronounced in the case of white males.

No significant differences between the percentage located in the different race-sex groups were noted, except that white females show a lower percentage than nonwhite females.

It would seem that the more casual the relationship between patient and contact, the less likelihood that the patient could give information sufficient to locate the contact. A separate study of contacts investigated in 2 areas, showing the results of the investigation of 6,861 contacts classified by the relation of the contact to the patient, indicates that this is true. For marital contacts the percentage located was 68 percent; for friends, 50 percent, and for pick-ups, 44 percent.

As is indicated by table 2, there were differences in these two areas between race-sex groups in the percentage of contacts classified as marital, friends, pick-ups, and prostitutes.

### Percentage Infected

From the earliest attempts at systematic contact investigation, it has been realized that not all persons with whom a patient has sexual intercourse while in the period of incubation or open lesions will be infected. Thus it is possible that the percentage of contacts who are found to be infected may vary from one group to another. Table 3 shows, by race and sex, the percentage of examined contacts found to be infected in the 19 areas. Within each regional grouping, there was considerable variation between States in the percentage infected. A number of factors, some concerned with policies and procedures in the various areas and some concerned with characteristics of patients and their contacts, might offer partial explanation of these differences.

<sup>3</sup> The reports on which this paper is based show the results of investigation of contacts reported by patients in each area. Some of these contacts were investigated in areas other than that reporting the contact, but the majority of contacts were reported and investigated in the same area.



**Table 2.—Relation of contact to patient, by race and sex of contact—contacts of primary and secondary syphilis reported for investigation**

[2 areas: January 1946 to June 1947]

Race and sex of contact	Relation to patient									
	Total		Marital		Friend		Pick-up		Prostitute <sup>1</sup>	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
White male.....	312	100.0	63	20.2	207	66.3	42	13.5	0	0
White female.....	375	100.0	50	13.3	184	49.1	125	33.3	16	4.3
Nonwhite male.....	2,992	100.0	336	11.2	2,420	80.9	230	7.7	6	.2
Nonwhite female.....	3,182	100.0	314	9.9	2,103	66.1	736	23.1	29	.9
Total.....	6,861	100.0	763	11.1	4,914	71.6	1,133	16.5	51	.7

<sup>1</sup> Also includes customers named by prostitutes.

**Table 3.—Percentage of examined contacts of primary and secondary syphilis who were found to be infected—by race and sex of contact**

[19 areas: January to December 1946]

Area	Average percentage infected				
	Total all contacts <sup>1</sup>	White		Nonwhite	
		Male	Female	Male	Female
South.....	54.2	48.9	51.8	52.5	57.5
Non-South.....	55.2	49.0	52.0	60.6	59.9
Large cities.....	57.1	54.4	49.8	53.5	61.4
All areas.....	54.1	50.4	51.3	55.3	59.3

<sup>1</sup> Includes race and sex not stated.

One possible source of variation might lie in differences in the average number of contacts named by various groups of patients. Here the thought is that the larger the number of contacts named, the smaller may be the percentage of examined contacts found to be infected. However, previous analysis has indicated that this factor plays a very minor role in explaining differences in the areas under consideration (1).

Another source of variation may lie in differences in the percentage of named contacts who are located and examined; it is possible that a different proportion of located contacts are found to be infected than would be the case with unlocated contacts. Thus, areas which locate a high percentage of contacts may find a

lower percentage of located contacts infected than would areas which locate only a small percentage of contacts. That this situation may be the case is indicated by the fact that, in the areas studied, there is an inverse relationship between the percentage of contacts located and the percentage of examined contacts found to be infected; the higher the percentage of contacts located, the lower the percentage of examined contacts found to be infected.

Other sources of variation may be the diagnostic ability of the examining clinic or physician and the degree of success in adhering to the policy of repeated examinations on noninfected contacts for a period of 3 months following the date of last exposure to the informant.

It has been felt generally that the marital partners of patients with primary and secondary syphilis are more likely to be infected than are nonmarital partners. It might be argued likewise that a contact who was exposed to the patient only once, as a pick-up, is less likely to become infected than is a "steady friend" who has many exposures to the patient. This seems to be indicated by table 4, which shows the results of examination in 2 areas of 3,464 contacts of primary and secondary syphilis during the period January 1946 to June 1947. Therefore, differences between groups in the proportion of types of contacts, as classified by their relation to the patient interviewed, might explain part of the variation in the percentage found infected.

parisons of epidemiologic indices between areas are valid regardless of regional location or of the racial composition of the population.

Although there was no consistent pattern for all States, in general, a higher percentage of nonwhite males than white males were infected of those located. This difference was even more pronounced in the females, where a significantly higher percentage of nonwhite females were infected than of white females.

Among both white and colored contacts located, a higher percentage of females than males were infected. This was true in most of the States and cities.

In comparing the average percentage infected in the three regional groupings,

**Table 4.—Results of examination of contacts of primary and secondary syphilis reported for investigation—by relation of contact to patient**

[2 areas: January 1946 to June 1947]

Relation to patient	Total contacts			Contacts completely identified			Contacts incompletely identified		
	Examined	Infected		Examined	Infected		Examined	Infected	
		Number	Percent		Number	Percent		Number	Percent
Marital.....	520	287	55.2	417	232	55.6	103	55	53.4
Friend.....	2,433	959	39.4	1,200	554	46.2	1,233	405	32.8
Pick-up, no fee paid.....	501	158	31.5	143	47	32.9	358	111	31.0
Prostitute <sup>1</sup> .....	10	7	70.0	2	1	50.0	8	6	75.0

<sup>1</sup> Also includes customers named by prostitutes.

It can readily be seen (table 3) that there are variations in the percentage of contacts found infected, both between regions and between race-sex groups. In making a statistical analysis of this material, however, we find that these differentials are small, of doubtful statistical significance, and point in such diverse directions as to make any clear-cut statement on the problem impossible. But the material presented in this paper, plus the lack of correlation between the percentage infected and the over-all results of contact investigation as measured by the epidemiologic index (1) indicates that com-

we find that there were no significant differences between regions in any of the four race-sex groups, nor in the total.

One of the factors most often advanced as an explanation of group differences in percentage infected is the general level of syphilis prevalence in the group. Some investigators have felt that groups with a high level of general syphilis prevalence would show a much higher percentage of infection in examined contacts than would groups with lower general prevalence. It has even been felt in some quarters that this difference would be so great as to preclude any valid comparison of the

results of contact investigation in different areas.

An attempt was made to determine what relationship existed between the percentage infected and the syphilis prevalence in the area. The only estimates of syphilis prevalence available were the figures for the first 2 million selectees tested. Using these as an estimate of prevalence, we find a total lack of correlation between prevalence and percentage of examined contacts found to be infected in each of the four race-sex groups. This lack of correlation is not entirely unexpected since the group of contacts with whom we are dealing is undoubtedly not a representative sample of the general population whose prevalence was estimated, but a group affected by a specific prevalence rate which may be entirely independent of that of the general population.

### Summary and Conclusions

1. Reports from 19 areas of the results of the investigation of 72,738 contacts of primary and secondary syphilis are presented. The study shows by race, sex, and regional location, the percentage of named contacts who were located and the percentage of examined contacts who were found to be infected. Additional data are presented from 2 areas showing the above information by relationship of contact to patient.

2. The following conclusions regarding the percentage of contacts located are drawn from this study:

(a) The more rural areas locate a higher percentage of named contacts, except in the case of white male contacts, where there seems to be little difference between rural and urban areas.

(b) The average percentage of locations is lowest in the group of white female contacts. The average percentage located is practically the same for white male contacts, nonwhite male contacts, and nonwhite female contacts.

(c) The relationship of the contact to the original informant is a factor in determining the ultimate success or failure in locating the contact.

3. The following conclusions regarding the percentage of examined contacts who are found to be infected are drawn from this study:

(a) The higher the percentage of contacts located, the lower the percentage of examined contacts found to be infected.

(b) The more prolonged the relationship between the patient and the contact, and therefore the greater the number of exposures, the greater is the likelihood of the contact being infected.

(c) The general level of syphilis prevalence in an area shows no relationship with the percentage of examined contacts who are found to be infected in that area.

(d) In comparing the average percentage of examined contacts found to be infected in each race group, we find that the nonwhite percentage is higher in both the males and the females. The differences were significant in the females, but not in the males.

(e) In comparing the average percentage of examined contacts found to be infected in each sex group, we find that in the white groups the percentages are practically the same, but in the nonwhite groups there is a significantly higher percentage found to be infected in the group of female contacts.

### Statistical Appendix

#### *Percentage Located*

A. *Area differences.*—An analysis was made of the variance between the 19 areas in the percentage of contacts located for the year 1946. Significant differences were found between areas within each race-sex group and for the total. When these areas were grouped by regions, however, the differences between regions were



not found to be significant for any race-sex group. Using the percentage of each area's 1940 population living in places of more than 2,500 population as a measurement of urbanization, the following correlation coefficients between urbanization and percentage of contacts located were obtained:

- White male----- —0.1769, not significant.
- White female----- —0.5796, significant at 1-percent level.
- Nonwhite male--- —0.4131, significant at 5-percent level.
- Nonwhite female\_ —0.4353, significant at 5-percent level.

B. *Race and sex differences.*—Tables 5 and 6 indicate, for each area and for each half-year period as well as for the 12-month total, the race or sex group showing the higher percentage of contacts

located of the two groups compared. Tests of significance between groups in individual areas were made by the usual method of testing the significance of difference between two percentages. Test of significance between the averages of percentages were made by the analysis of variance technic.

Percentage Infected

A. *Area differences.*—Table 3 indicates that there is considerable difference between areas in the percentage of examined contacts found infected in each of the four race-sex groups, as well as in total. However, these differences, although highly significant statistically between some areas, do not follow any consistent pattern.

In comparing the average percentage infected in the three regions, we find that there were no significant regional

Table 5.—Differences between males and females in percentage of located contacts of primary and secondary syphilis

[19 areas: January to December 1946]

Area and State	White			Nonwhite		
	First 6 months	Second 6 months	Total 12 months	First 6 months	Second 6 months	Total 12 months
South:						
Alabama-----	F	M	M	M	M	M
Arkansas-----	M	F	<sup>1</sup> F	M	<sup>2</sup> M	<sup>2</sup> M
Georgia-----	F	M	M	F	F	F
Kentucky-----	M	M	M	Same	M	M
North Carolina-----	M	M	M	M	F	M
Oklahoma-----	M	F	M	M	F	M
South Carolina-----	M	F	M	F	<sup>1</sup> F	<sup>2</sup> F
Texas-----	F	F	F	F	Same	F
Average-----	M	F	Same	M	F	M
Non-South:						
Colorado-----	<sup>2</sup> M	<sup>2</sup> M	<sup>2</sup> M	M	M	M
Kansas-----	F	Same	F	F	F	F
Michigan-----	F	M	M	M	M	M
Nebraska-----	M	M	M	F	F	F
Ohio-----	Same	M	M	F	F	F
West Virginia-----	M	F	F	F	Same	F
Average-----	M	M	M	F	Same	F
Large cities.						
Chicago-----	M	<sup>2</sup> M	<sup>2</sup> M	<sup>2</sup> M	<sup>2</sup> M	<sup>2</sup> M
District of Columbia-----	F	M	F	F	<sup>2</sup> M	M
New York City-----	M	M	<sup>1</sup> M	M	M	M
Pittsburgh-----	F	M	M	F	F	F
St. Louis-----	M	F	M	F	F	F
Average-----	M	<sup>1</sup> M	M	Same	M	M
Grand average-----	M	M	M	F	M	Same

<sup>1</sup> Significant at 5-percent level.  
<sup>2</sup> Significant at 1-percent level.

NOTE: Letters indicate group showing higher percentage of located contacts (M—male; F—female). "Same" indicates no difference in percentage between the two groups.

**Table 6.—Differences between whites and nonwhites in percentage of located contacts of primary and secondary syphilis**

[19 areas: January to December 1946]

Area and State	Male			Female		
	First 6 months	Second 6 months	Total 12 months	First 6 months	Second 6 months	Total 12 months
North:						
Alabama.....	NW	NW	NW	W	<sup>2</sup> NW	<sup>1</sup> NW
Arkansas.....	NW	<sup>2</sup> NW	<sup>1</sup> NW	NW	<sup>2</sup> W	<sup>1</sup> W
Georgia.....	NW	W	W	Same	NW	NW
Kentucky.....	<sup>2</sup> NW	NW	<sup>2</sup> NW	<sup>2</sup> NW	NW	<sup>2</sup> NW
North Carolina.....	NW	W	NW	NW	<sup>1</sup> NW	<sup>2</sup> NW
Oklahoma.....	Same	<sup>1</sup> NW	NW	NW	NW	NW
South Carolina.....	W	NW	W	NW	NW	NW
Texas.....	NW	<sup>2</sup> NW	<sup>2</sup> NW	NW	<sup>2</sup> NW	<sup>2</sup> NW
Average.....	NW	NW	NW	<sup>1</sup> NW	NW	NW
South:						
Colorado.....	W	W	W	NW	NW	NW
Kansas.....	NW	W	W	W	W	W
Michigan.....	<sup>1</sup> NW	W	NW	<sup>1</sup> NW	NW	<sup>2</sup> NW
Nebraska.....	W	Same	W	W	NW	NW
Ohio.....	NW	Same	NW	NW	<sup>2</sup> NW	<sup>2</sup> NW
West Virginia.....	W	NW	Same	NW	W	NW
Average.....	W	W	W	NW	NW	NW
Large cities:						
Chicago.....	NW	NW	NW	NW	<sup>2</sup> NW	<sup>2</sup> NW
District of Columbia.....	NW	NW	NW	W	NW	NW
New York City.....	W	W	W	NW	NW	NW
Pittsburgh.....	W	W	W	W	NW	NW
St. Louis.....	NW	<sup>2</sup> NW	<sup>2</sup> NW	<sup>2</sup> NW	<sup>2</sup> NW	<sup>2</sup> NW
Average.....	Same	NW	NW	NW	<sup>2</sup> NW	<sup>1</sup> NW
Grand average.....	Same	NW	NW	NW	<sup>1</sup> NW	<sup>2</sup> NW

<sup>1</sup> Significant at 5-percent level.  
<sup>2</sup> Significant at 1-percent level.

NOTE: Letters indicate group showing higher percentage of located contacts (W—white; NW—nonwhite). "Same" indicates no difference in percentage between the two groups.

Differences in any of the four race-sex groups.

An attempt was made to determine what relationship existed between the percentage infected and the syphilis prevalence in the area. The only estimates of syphilis prevalence available were the figures for the first 2 million selectees tested. Using these as an estimate of prevalence, we find no significant correlation between prevalence and percentage infected in any of the four race-sex groups.

- White male..... —0.27, not significant.
- White female.. —0.081, not significant.
- Nonwhite male..... —0.35, not significant.
- Nonwhite female..... —0.29, not significant.

B. Race and sex differences.—Tables 7 and 8 indicate, for each area and for each half-year period as well as for the

12-month total, the race, or sex group showing the higher percentage of examined contacts found to be infected of the two groups compared. Tests of significance between groups in individual areas were made by the usual method of testing the significance of difference between two percentages. Tests of significance between the averages of percentages were made by the analysis of variance technic.

C. Relationship of percentage located and percentage found infected.—Covering the 6-month period from January 1945 through December 1946, a total of 71 pairs of observations were available from these 19 areas for the investigation of the relationship between the percentage of contacts located and the percentage of examined contacts found to be infected. A negative correlation coefficient of 0.51 was obtained, which was significant at the 1-percent level.

Table 7.—Differences between sexes in percentage infected of examined contacts of primary and secondary syphilis

[19 areas: January to December 1946]

Area and State	White			Nonwhite		
	First 6 months	Second 6 months	Total 12 months	First 6 months	Second 6 months	Total 12 months
South:						
Alabama.....	F	M	M	F	F	F
Arkansas.....	F	F	F	F	<sup>2</sup> F	<sup>2</sup> F
Georgia.....	Same	F	F	M	M	M
Kentucky.....	M	<sup>2</sup> F	F	F	F	F
North Carolina.....	F	F	<sup>1</sup> F	F	<sup>1</sup> F	<sup>2</sup> F
Oklahoma.....	M	M	M	Same	F	F
South Carolina.....	F	F	F	F	F	<sup>2</sup> F
Texas.....	M	M	M	F	F	<sup>2</sup> F
Average.....	F	F	F	<sup>2</sup> F	<sup>1</sup> F	<sup>1</sup> F
Non-South:						
Colorado.....	M	M	M	M	M	M
Kansas.....	M	M	M	M	M	M
Michigan.....	M	<sup>1</sup> F	F	F	M	F
Nebraska.....	F	M	F	Same	F	F
Ohio.....	F	Same	F	M	F	M
West Virginia.....	F	<sup>2</sup> F	<sup>2</sup> F	F	F	F
Average.....	F	F	F	M	M	M
Large cities:						
Chicago.....	M	M	M	F	F	<sup>2</sup> F
District of Columbia.....	F	M	F	M	F	F
New York City.....	M	<sup>1</sup> M	M	F	F	F
Pittsburgh.....	M	F	M	F	F	<sup>2</sup> F
St. Louis.....	M	F	F	F	F	F
Average.....	M	M	M	F	<sup>1</sup> F	F
Grand average.....	M	F	F	F	F	<sup>1</sup> F

<sup>1</sup> Significant at 5-percent level.

<sup>2</sup> Significant at 1-percent level.

NOTE: Letters indicate group showing higher percentage of examined contacts of primary and secondary syphilis (M—male; F—female). “Same” indicates no difference in percentage between two groups.

Table 8.—Differences between whites and nonwhites in percentage infected of examined contacts of primary and secondary syphilis

[19 areas: January to December 1946]

Area and State	Male			Female		
	First 6 months	Second 6 months	Total 12 months	First 6 months	Second 6 months	Total 12 months
South:						
Alabama.....	<sup>2</sup> NW	<sup>2</sup> W	NW	<sup>2</sup> NW	<sup>2</sup> NW	<sup>2</sup> NW
Arkansas.....	NW	<sup>1</sup> NW	NW	NW	<sup>2</sup> NW	<sup>1</sup> NW
Georgia.....	NW	NW	<sup>2</sup> NW	<sup>1</sup> NW	<sup>1</sup> NW	<sup>2</sup> NW
Kentucky.....	<sup>2</sup> W	NW	W	NW	W	W
North Carolina.....	<sup>1</sup> NW	<sup>1</sup> NW	<sup>2</sup> NW	<sup>2</sup> NW	NW	<sup>1</sup> NW
Oklahoma.....	NW	NW	NW	NW	NW	<sup>1</sup> NW
South Carolina.....	<sup>2</sup> W	NW	W	W	W	W
Texas.....	NW	W	W	<sup>2</sup> NW	NW	<sup>2</sup> NW
Average.....	NW	NW	NW	<sup>1</sup> NW	NW	<sup>1</sup> NW
Non-South:						
Colorado.....	NW	<sup>1</sup> NW	NW	NW	NW	NW
Kansas.....	NW	NW	NW	NW	NW	NW
Michigan.....	NW	NW	NW	<sup>1</sup> NW	W	NW
Nebraska.....	W	NW	NW	W	NW	NW
Ohio.....	NW	NW	NW	W	<sup>1</sup> NW	NW
West Virginia.....	NW	<sup>2</sup> NW	<sup>2</sup> NW	NW	NW	NW
Average.....	<sup>1</sup> NW	<sup>1</sup> NW	NW	NW	NW	NW

See footnotes at end of table.



**Table 8.—Differences between whites and nonwhites in percentage infected of examined contacts of primary and secondary syphilis—Continued**

[19 areas: January to December 1946]

Area and State	White			Nonwhite		
	First 6 months	Second 6 months	Total 12 months	First 6 months	Second 6 months	Total 12 months
Large cities:						
Chicago.....	W	W	W	NW	NW	<sup>1</sup> NW
District of Columbia.....	NW	W	Same	NW	W	NW
New York City.....	W	NW	W	NW	<sup>1</sup> NW	<sup>2</sup> NW
Pittsburgh.....	<sup>2</sup> W	NW	W	<sup>1</sup> NW	NW	<sup>2</sup> NW
St. Louis.....	NW	<sup>2</sup> NW	<sup>2</sup> NW	NW	NW	<sup>2</sup> NW
Average.....	W	NW	W	<sup>1</sup> NW	NW	<sup>2</sup> NW
Grand average.....	NW	<sup>2</sup> NW	<sup>1</sup> NW	<sup>2</sup> NW	<sup>2</sup> NW	<sup>2</sup> NW

<sup>1</sup> Significant at 5-percent level.  
<sup>2</sup> Significant at 1-percent level.  
NOTE.—Letters indicate group showing higher percentage of examined contacts of primary and secondary syphilis (W—white; NW—nonwhite). “Same” indicates no difference in percentage between two groups.

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# A Rapid Slide Method for the Titration of Antibodies in Syphilitic Serum<sup>1</sup>

Abraham G. Osler, Ph. D., and Daniel Widelock, Ph. D.<sup>2</sup>

The widespread use of intensive syphilotherapy has accentuated the need for the titration of antibodies in syphilitic serum as an aid in the appraisal of therapeutic progress. This report describes a rapid slide flocculation procedure designed to meet the requirements of laboratories in which the titration of large numbers of serums by the customary serial dilution procedure presents technical difficulties.

Antibody titers for comparative studies are conventionally determined by the in-

<sup>1</sup>From the Bureau of Laboratories, New York City Department of Health.  
<sup>2</sup>With the statistical and technical assistance of George Kerchner and Eugene Levine, Statistical Division, and Miss Diana Rosenberg, New York City Department of Health.

teraction of a constant amount of antigen with a series of increasing serum dilutions. A technic is proposed which facilitates estimations of antibody titers in syphilitic serum through the use of varying amounts of both serum and antigen. This manipulation is accomplished directly on a slide, thus eliminating the need of preparing a series of tube dilutions for each serum tested. The volumes of serum and antigen used in the slide test have been established experimentally to yield titers that correspond with those obtained by the usual serial serum dilution method. Comparative tests with 400 serums indicate that the direct slide technic may be satisfactorily substituted for the more cumbersome tube dilution procedure.

Experimental Materials and Methods

Positive serums from specimens submitted for routine serologic tests for syphilis were inactivated (at 56° C. for 30 minutes) and used in this study.

A cardiolipin-lecithin-cholesterol mixture<sup>3</sup> prepared as for the VDRL slide test (1) was used as the antigen. Saline (0.9 percent NaCl) and antigen were added by means of 2-ml. syringes, fitted with 23-gage needles. The syringes were held horizontally with the needle bevel down. The needles were tested daily to insure delivery of 60 (±2) drops of antigen and 48 (±2) drops of saline per milliliter. Thoroughly cleaned 3'' x 2'' glass slides were prepared with 12 paraffin rings, as for use in the Kline slide flocculation test (2).

Slide Test

The following protocol describes the procedure for the rapid slide test.

The diluted serum (1:20) is drawn into a 0.2-ml. pipette (graduated in 0.01 ml.) above the zero mark. The pipette tip is wiped with filter paper and the serum level adjusted to the zero mark by holding the tip of the pipette against the inner wall of the test tube. Serum is then delivered into the slide rings Nos. 6, 5, and 4. Volumes of undiluted serum as shown in table 1 are similarly added to rings Nos. 3, 2, and 1.

After addition of the saline and antigen, the slides are rotated mechanically on a Boerner type rotator for 4 minutes at 180 r. p. m. Flocculation is read microscopically at a magnification of 100× and is recorded as 0, +, ++, +++, and +++++. Results are reported in terms of the greatest dilution of serum which shows definite flocculation of 2+ or more. Sensitivity of the antigen is checked daily in tests with saline and serum of previously determined titer.

<sup>3</sup> This antigen was supplied by the Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island, N. Y.

Table 1

Slide ring	Serum (ml.)	Saline (drops)	Antigen (drops)	Equivalent to a serum dilution of—
	<i>Undiluted</i>			
1-----	0.02	1	1	1:2
2-----	.01	2	1	1:5
3-----	.01	2	2	1:10
	<i>1:20 dilution</i>			
4-----	.05	None	1	1:20
5-----	.02	1	1	1:40
6-----	.02	1	2	1:80

Titers greater than 1:80 may be estimated by employing a serum dilution of 1:160 in rings Nos. 7, 8, and 9 with volumes of serum, saline, and antigen corresponding to those in rings Nos. 4, 5, and 6.

Tube Dilution Method

Serial dilutions of each serum are prepared in the usual manner to yield 1:2, 1:5, 1:10, 1:20, 1:40, and 1:80 dilutions.

One-twentieth (0.05) of a milliliter of the 1:80 dilution is delivered from a 0.2-ml. pipette into ring No. 6 of a glass slide. The same pipette is used for the delivery of the remaining dilutions (1:40 to 1:2) into individual rings. One drop of antigen is added to each volume of diluted serum and the slide is then rotated and examined as described previously.

Results

The titers obtained by the two procedures with each serum of a consecutive series of 400 specimens are given in figure 1. A further comparison of the results is shown in figure 2.

Substitution of the Mazzini antigen (3) for the cardiolipin antigen in a second series of 130 serums yielded results entirely comparable to those shown in figure 1.

Discussion

A statistical analysis of the data shows:

- 1. There is no significant difference between the tube dilution and the rapid slide procedures either as to mean titers or range of readings.

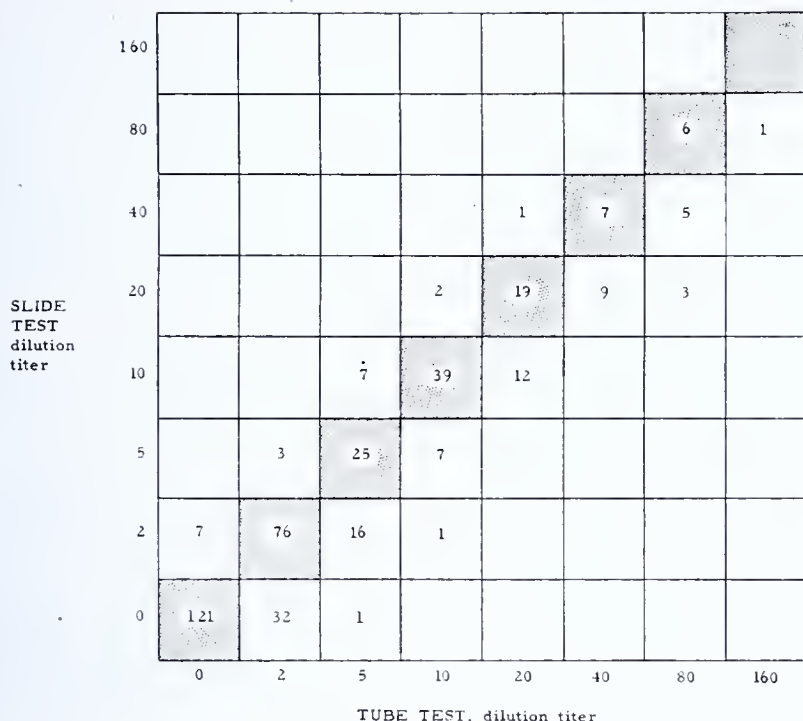


FIGURE 1.—Correlation of titers obtained by direct slide and tube dilution procedures with each of 400 serums tested.

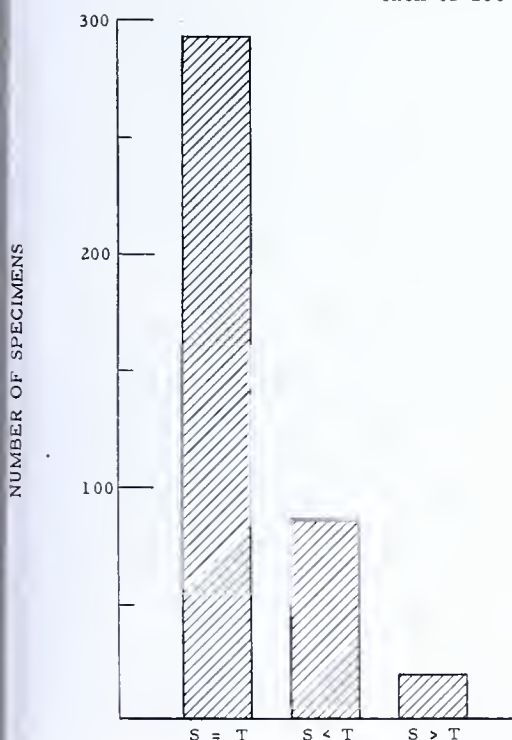


FIGURE 2.—Comparison of results obtained with direct slide and tube procedures.  
 S=T: Identical titers in 293 specimens.  
 S<T: Higher titers obtained with tube dilution (87 specimens).  
 S>T: Lower titers obtained with tube dilution (20 specimens).

2. The correlation coefficient between the two procedures is found to be  $+0.95 \pm 0.01$ .

3. Identical titers were obtained in 73 percent of the serums tested (col. 1, fig. 2). Only 5 of 400 serums showed a difference in titer greater than one dilution. In 25 percent or 102 of 400 specimens, a difference in titer equivalent to one dilution was found.

Of the 107 specimens showing a difference, 87 specimens showed a higher titer in the tube dilution procedure than in the slide test. This may be attributed, in part at least, to the carrying over of serum in the course of preparing serial dilutions for the tube test. The differences found between the two tests, however, are not statistically significant and approximate the magnitude of differences which might be anticipated in repeated tests performed by either procedure alone.

Because the rapid slide test requires only 0.25 ml. of serum, titer estimations in infants suspected of congenital syphilis are thus facilitated.

The use of twice the volume of antigen in slide rings Nos. 3 and 6 does not im-



pair the reading of the tests. In these rings, the additional antigen serves to provide a sufficient excess in relation to the amount of antibody present so that flocculation is partially or completely inhibited. In this manner, serum titers are obtained which are comparable to those determined by the serial tube dilution method without the actual preparation of the serum dilutions.

That the observed inhibition is due to excess antigen has been confirmed in numerous tests. For example, equal volumes (0.05 ml.) of serums diluted to the highest titer capable of yielding definite flocculation were tested in duplicate. To one volume of serum two drops of antigen were added. The second volume of serum received one drop of antigen plus one drop of saline. Flocculation was far more frequently inhibited in the serum dilution containing the greater amount of antigen.

## Summary

1. A rapid slide flocculation test for the titration of antibodies in syphilitic serum is described.
2. Data are presented indicating that this test may be satisfactorily substituted for the conventional tube dilution procedure using either the Mazzini or cardiolipin antigens.

## References

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# Report of the Advisory Committee on Education for the Prevention of Venereal Diseases<sup>1</sup>

## Introduction

Acting as a full committee, or with one or more of its members serving on other groups studying some particular aspect of venereal disease education, this committee has participated in five studies prior to the current study represented by this report.

These preceding studies and reports were:

1. The report of the Section on Education and Community Action, National Conference on Postwar Venereal Disease Control, St. Louis, Mo., November 9 to 11, 1944.

<sup>1</sup> To the Surgeon General, U. S. Public Health Service, dated Apr. 14, 1948.

2. A study made through the medium of questionnaires mailed by this committee to the health officers of State and large city health departments relative to the St. Louis report.
3. The analysis by and report of this committee to the Surgeon General, dated June 3, 1944, which dealt with the use of radio and motion pictures.
4. Testimony of witnesses at a meeting of this committee held April 17 and 18, 1945. The report to the Surgeon General was dated July 18, 1945.
5. Analysis of venereal disease education materials available from all national sources, made by the spe-

cial National Evaluation Committee of the Venereal Disease Division, United States Public Health Service, and the Venereal Disease Education Institute; and the report of the Audio-Visual Subcommittee, dated April 7, 8, and 9, 1947. This report showed the paucity of suitable educational material for the Negro.

A summary of these reports is contained in an appendix to this report.

### **Present Inquiry**

In the spring of 1947 it was determined that the committee should extend this series of inquiries further in order to define more precisely the practical steps that should be taken if the more or less generalized findings of the earlier studies were to be translated into actual, effective practice.

Therefore, the members of this committee met in the chairman's office on October 3 and 4, 1947. The first day of the meeting was devoted to hearing the opinions of a large number of witnesses representing organizations concerned with public health, private medical practice, social hygiene, education and social welfare of minority groups of the general population, and of technical experts in the field of public education methods and materials. The second day was devoted to an analysis by the committee of this testimony in relation to the conclusions of the earlier studies and to ways and means of practical application in a manner likely to influence favorably the Nation-wide effort to control venereal diseases.

### **Conclusions Derived From the Present Inquiry**

The committee quickly and unanimously came to the conclusion that whereas a major proportion of the diagnostic, treatment, and epidemiologic efforts of the national venereal disease control program is devoted to serving Ne-

groes, almost all organized preventive and case-finding education is designed and conducted primarily for members of the white race.

The committee recognizes that, for a variety of reasons, incidence and prevalence data on venereal disease in any specific population group are usually incomplete and unreliable. The committee thinks strongly that extreme caution should be exercised in the release of statistics about the prevalence and incidence of venereal disease among Negroes, or for that matter in any specific population group.

It is believed, however, that sufficient reliable data are available (particularly the results of selective-service blood testing) to prove that venereal disease rates among Negroes are disproportionately high and that the educational program for Negroes is not geared to this fact.

### ***Educational Implications of In-Patient Versus Out-Patient Treatment***

It should be emphasized that every aspect of patient management influences the patient's attitude toward and his information about venereal disease. No part of venereal disease control can be judged independently of methods and facilities for diagnosis and treatment. Facilities and methods can be classified roughly into out-patient and in-patient categories. Out-patient clinics, despite their many advantages as a treatment source, are nevertheless subject, generally speaking, to certain criticism. The leading defects have been recognized on numerous occasions by the United States Public Health Service.

Under present conditions this committee realizes that in-patient treatment facilities afford certain definite advantages:

1. Because of affording a very excellent treatment resource for "floating" populations and low-income groups.
2. Because more complete contact information can be obtained.

3. Because of educational advantages to patients through the longer period they are available to the staff, and the more efficient staff members available in special treatment centers.
4. Because the course of treatment for syphilis is completed in a much higher percentage of cases than with extended out-patient treatment.
5. Because of the better general medical attention it is possible to give to patients who are hospitalized.

However, the question of relative costs of in-patient to out-patient treatment deserves more study.

It is recognized that the development of penicillin treatment schedules suitable for out-patient use in syphilis will probably result in a strong trend back to reliance on ambulatory treatment for infectious syphilis. Therefore, it is obvious that a greater effort should be made to improve the quality of service available in the average clinic, particularly the quality of education directed toward prevention of infection and diagnostic follow-up; to encourage early voluntary reporting in case of reinfection; and to aid in obtaining names of contacts.

Although every effort should be made to improve the medical care of both Negro and white patients in the average clinic, this trend toward out-patient treatment and the increasing number of cases of reinfections under short schedules of treatment suggest that greater effort should be made to improve patient education. Only thus will there be compensation for loss of the distinct educational advantage now found in rapid treatment centers.

### *The Influence of Social Factors on Venereal Disease Rates in Negroes*

This committee is convinced that poor housing, poor educational opportunities, adverse economic conditions, and related conditions contribute to the spread of venereal disease among Negroes. Commer-

cialized prostitution may likewise play a part, although probably less so than in the white race. Other factors may well be the use of alcohol, and the overemphasis upon sex found in motion pictures, literature, and advertisements. However, the committee feels that recommendations for combating these problems by educational means are beyond its scope.

Although the majority of this committee believes that education for personal prophylaxis has been sadly neglected, it recognizes that increased effort to promote personal prophylaxis will not materially affect the venereal disease rate among Negroes, nor in any other group having poor economic status. However, the vigorous preaching, by physicians and other staff members of clinics and hospitals, on the free use of soap and water after sexual intercourse would seem to be a method well worth trying.

### *Education in Secondary Schools*

It is conceded that, to be most effective, sex education and venereal disease education should be begun at not later than 10 years of age. It is obvious that parents cannot be relied upon for this education. This throws the problem upon the school, with perhaps some aid from the church. In both the school and the church it is likewise unfortunately true that but few teachers are emotionally or intellectually fitted to teach the subject.

The training of teachers to do effective health education work in schools, as well as of health educators for adult education, must be accomplished in the graduate schools of public health education. Nevertheless, it has been demonstrated that the average teacher-training school can give very effective instruction in this subject to large numbers of classroom teachers.

The committee hopes that ways and means can be found to offer in one or more Negro colleges federally aided courses in health and human relations, similar to the courses developed elsewhere.



From the evidence, it is obvious that effective educational programs in secondary schools cannot be conducted without preparatory indoctrination of parent-teacher organizations, school boards, ministers, and the important opinion-forming forces of the community. It is equally obvious that both the preparation of teachers and of these external groups, in fact the entire planning and conduct of the program, must be carried forward as a joint enterprise of the official public health and public education authorities with as much assistance as it is possible to obtain from medical, social welfare, and social hygiene organizations.

### **Adult Education**

The previous studies and reports have covered this field in great detail. The present report, therefore, will be concerned only with a few incidental matters and with comments on one important and relatively new development not covered in the earlier studies.

The committee is convinced that the most effective type of health education is that which is given by the well-prepared public health nurse in her regular work with individual groups in the clinics, in homes, and in industry. It believes that the greatest possible advance in venereal disease education of both adults and children of lower and middle income groups would result from greater expansion of public health nursing services.

Whether or not such expansion is possible in any particular area, it is nevertheless the responsibility of the health officer and of the nurses themselves to make maximum use of the venereal disease educational opportunity that is inherent in the profession of public health nursing.

The committee wishes to reiterate its belief that properly enforced premarital and prenatal laws are among the most effective of all venereal disease educational measures. It is urged that in States lacking prenatal and premarital laws, health officers should make every effort to obtain such legislation.

### **Case-Finding Education**

The new development brought to the attention of the committee is the apparent effectiveness of intensive public education through mass mediums for the specific purpose of encouraging persons with symptoms of infectious venereal disease to seek medical attention voluntarily. Several demonstration programs of this character, conducted jointly by the United States Public Health Service and State or local health authorities, were described to the committee.

It appears that through this means the proportion of persons who receive adequate treatment in the early infectious stages of syphilis and in the acute stage of gonorrhea can be very greatly increased. It appears that not only is this effect produced during the course of the actual educational campaign, but also that increased voluntary reporting for diagnosis continues for several months afterwards.

Few data are apparently available at this time as to the effect such educational campaigns may have on other essential elements of venereal disease education and control and upon general health education. It would seem advisable for the appropriate public health or voluntary agencies to study these possible side effects.

It would also seem to the committee that, as soon as full reports of these demonstration programs are published,<sup>1</sup> State

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<sup>1</sup> EDITOR'S NOTE: Reports of several case-finding demonstrations have been published in the JOURNAL OF VENEREAL DISEASE INFORMATION. The reader is referred to these reports for purposes of comparing and analyzing the different technics, special methods and experiments, and varieties of emphasis. The issues in which the reports appeared are as follows: January 1948, the Arkansas demonstration, stressing intensive contact investigation; February 1948, Oklahoma City, mass public information with an experiment in voluntary physical examinations; March 1948, Louisville-Jefferson County (Kentucky), intensive educational case finding, stressing symptoms and dangers; April 1948, Delta Plantation (Leflore County, Miss.), screen physical examinations combined with mass blood testing; May 1948, Georgia, mass blood testing with special technics used in one or more of eight communities.

and local health officers should analyze them carefully to determine the practicability of adapting some of the procedures involved as a continuing part of their regular control activities.

It was gratifying to the committee to learn that in many of these demonstrations special attention was given to educating Negro and other low-income groups presumed to have high incidence rates. This recognition of the need for special attention should, in the opinion of the committee, be carried over into every other aspect of venereal disease education wherever the health officer finds that public diagnostic, treatment, and preventive educational services are especially needed by the Negro population.

### Discussion

This committee wishes to reaffirm its belief that public and patient education is as essential to effective venereal disease control in this country as are diagnosis and treatment. This belief has been shared by many important persons in medicine and public health for at least 50 years. However, the committee wishes to emphasize that education has not been carried out on a scale commensurate with the problem. Evidently this break-down has occurred primarily in the local health department.

1. The amount of careful planning, the funds, and the organized recruitment, training, and assignment of personnel to venereal disease education activities at Federal and State levels have apparently not been sufficient to carry out effective education throughout the average State.

2. Another weakness is the lack of widely accepted basic knowledge of methods for public education. Unless a large number of local educational programs are being carried on with some degree of consistency and continuity, there can be little hope of measuring and comparing the effectiveness of different methods, or of building a corps of health workers competent to plan, direct, and carry out good programs that reach every community.

3. Innumerable pamphlets, films, and posters of varying degrees of effectiveness have been produced, and their distribution and use in local programs have apparently been unorganized, spotty, and inconsistent through lack of qualified personnel and of effective guidance. It seems obvious that unless there is strong State and Federal support and guidance, many local health officers probably will not be able to make public and patient education an important part of their venereal disease control program.

The committee believes that with the development of out-patient schedules for the rapid treatment of syphilis and gonorrhea, extraordinary effort must be made to extend and improve venereal disease education throughout the country. It seems that in no other way can we cope with the increasingly acute problems of earlier case finding, infectious relapse, early reinfection, and the voluntary reporting for posttreatment observation.

### Recommendations

The committee therefore respectfully recommends to the Surgeon General and through him to the Venereal Disease Division of the United States Public Health Service, and to the various State health departments, positive action in three principal categories on a scale sufficient to meet the problems we have described:

1. *Sufficient expansion of personnel and funds allocated to venereal disease education to enable recruitment and training of personnel at Federal and State levels who can assist local health officers in making maximum use of local resources for education in four principal categories:*

- (a) Development of practical programs of social hygiene teaching in secondary schools. As a corollary, the organization of programs of educating parents, teachers, clergymen, and certain special organized groups in the community in venereal disease control and social hygiene principles.



- (b) Development of programs for sustained and intensive adult venereal disease education for the general public and special groups, to be included with existing programs of general health education.
- (c) Development where needed of intensive community-wide case-finding education programs directed through mass mediums to the entire population or to special groups, with emphasis on symptoms and on resources for diagnosis and treatment.
- (d) Development of programs for education of patients regarding relapse, reinfection, mode of spread, necessity of furnishing contact information, and the need for regular reporting for posttreatment observation.

2. *Intensification and redirection of the program for producing and using effective educational materials so that greater attention is given to the needs of the Negro population.*—It is suggested that the United States Public Health Service carefully plan and produce or arrange through other agencies for the production of educational materials especially designed for use among our Negro citizens. Although every aspect of venereal disease control should be covered adequately in these materials, it is deemed important that information and motivation leading to voluntarily sought diagnosis of early infectious syphilis and of syphilis in pregnant women be especially stressed.

These materials should include all appropriate and effective mediums, but the committee specifically suggests that at least one motion picture be produced. The committee believes that the approach utilized in this film should be documentary, but with sufficient drama to sustain interest and motivate action. It feels that if only one film can be produced, it should be designed for a general audience of adolescents and adults of both sexes and that Negro advisers, writers, and actors should be used.

In the presentation of Negro characters

in films, pamphlets, posters, radio broadcasts, and all other mediums, the committee urges that such characterizations be handled in a human, realistic, and dignified manner and that every precaution be taken to avoid any stereotyping or caricaturing.

The committee strongly believes it is essential that all educational materials, including films, radio transcriptions, and posters, should be designed so as to have definite interest for the group they are intended to reach. Otherwise such materials cannot effectively accomplish their desired educational effect. It is therefore recommended that before any new educational materials be released for general use, they should be given an appropriate test for interest and intelligibility with a sample audience representing the economic and educational levels as well as the racial and sex characteristics of the population groups they are intended to reach.

3. *Stimulation and promotion of instruction in health and human relations, particularly among Negro groups.*—It is suggested that the United States Public Health Service employ a Negro public health educator to carry out this function. Such an individual should be well grounded in public health and in education in order to be able to work with both health and educational agencies.

The specific tasks of this individual would be to carry on both preservice and in-service training of teachers in the content and methods of education on health and human relations. After investigation of the various educational institutions the services of this worker would be made available to a Negro university or teacher-training institution to conduct an accredited course on the subject. Every effort should be made to bring about the permanent inclusion in the curriculum of such a course for teachers, ministers, and social workers.

In addition, institutes, conferences, summer courses, and seminars should be conducted for in-service teachers in order to extend education of this type.



## Appendix

### *A Summary of the Reports Mentioned in the Introduction*

In general, the preceding studies have sought to establish broad general principles of venereal disease education with respect to: (a) underlying philosophy; (b) interrelationship with social hygiene or social protection activities; (c) interrelationship with other fields of health education; (d) functional aspects at Federal, State, and local levels; and (e) the availability and suitability of venereal disease educational materials.

The most important of the conclusions reached in these earlier studies were summarized in the report of this committee dated July 18, 1945. In less detail, these are again summarized below:

1. Public education and community action in venereal disease prevention and control are so closely interwoven as to be inseparable. The cooperation or active assistance of various types of community organizations is necessary to successful public venereal disease education.

2. Educational efforts should be directed largely to young people and Negroes who have the highest-incidence classification. Patients need special education to avoid reinfection.

3. Ideally, public education programs should be long-ranged and of sustained intensity.

4. Health departments need the aid of other agencies, both official and voluntary, in conducting programs of education and community action.

5. A large majority of State health officers believe that intensified long-ranged venereal disease education programs should be conducted as part of an intensified general health education and community organization program.

6. There is unanimous belief among State health officers that the needed type of community health education, including venereal disease education, can best be obtained through the full-time work of qualified health education personnel.

7. The majority of health officers be-

lieve that this personnel, for adult education, should be provided by or through health departments.

8. Health officers believe there is need for a large increase in the number of trained health educators, especially of Negroes.

9. Suggestions by the committee for community action were: That local health departments obtain aid for the achievement of the total objective through cooperative programs with social hygiene, religious, and professional groups, and agencies concerned with labor, management, and education. The health officer is obligated to develop educational and community action programs, and to work with the law enforcement agencies. He should endeavor to secure premarital or prenatal laws or regulations.

10. The United States Public Health Service should develop more films and radio scripts of high character.

11. The United States Public Health Service should make grants-in-aid only to States giving a minimum standard of public and patient education.

12. More study is needed regarding ways of reaching the "floating" population, and also the urban and rural Negroes.

13. Venereal disease education should be brought to industrial groups.

14. Endorsement by physicians of prophylaxis education of certain groups of venereal disease patients should be encouraged.

The deliberations of the National Evaluation Committee showed very clearly that most of the audio-visual educational materials pertaining to venereal diseases are hopelessly outdated, and, in the case of radio programs, lacking in interest. Most important was the discovery of an almost complete lack of material especially designed for Negro education.

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## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of articles concerned with venereal diseases or related subjects which have been published in the better known journals during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

### ACTA PATH. ET MICROBIOL. SCANDINAV., COPENHAGEN

Gram-negative diplo-bacilli from the genitourinary tract. Sverre Dick Henriksen. 24: 184-197, 1947.

A study of the growth conditions of *Haemophilus Ducreyi*. Flemming Reymann. 24: 208-212, 1947.

### AM. J. SYPH., GONOR. & VEN. DIS., ST.

#### LOUIS

Three years of penicillin alone in neurosyphilis. John H. Stokes, Howard P. Stelger and George D. Gammon. 32: 28-42, Jan. 1948.

\*A study of the nutritional requirements of the Reiter strain of *Treponema pallidum*. H. R. Whiteley and C. N. Frazier. 32: 43-52, Jan. 1948.

The effectiveness in experimental syphilis of penicillin in peanut oil-beeswax given in sixteen daily injections. William L. Fleming and Mary W. Holcombe. 32: 53-56, Jan. 1948.

The termination of therapeutic malaria with chloroquine. Robert R. Kierland and William G. McCreight. 32: 57-58, Jan. 1948.

Experimental mouse syphilis, a critical review of the literature. Boris Gueft and Paul D. Rosahn. Special Article. 32: 59-88, Jan. 1948.

**A study of the nutritional requirements of the Reiter strain of *Treponema pallidum*.** H. R. Whiteley and C. N. Frazier. Am. J. Syph., Gonor. & Ven. Dis., 32: 43-52, 1948.

The writers comment on the scarcity in the literature of observations on the specific nutritional requirements of *Treponema pallidum* and present a discussion of the growth of the Reiter strain in various mediums.

The nutritional requirements of the organisms were determined by studies on: (1) The rate of growth, determined

by measuring the turbidity of spirochetal cultures in different mediums; and (2) the number of subcultures capable of being supported by each medium. The mediums studied had the following constituents: (1) An anaerobic agent; (2) peptone, casamino acids, casein hydrolysate, or a mixture of amino acids; (3) serum albumin; (4) glucose; (5) vitamins; and (6) di-potassium phosphate, each of which was studied separately. All experiments included a control consisting of a medium deficient in the ingredient being tested. The details of the method used are given by the authors.

The findings were as follows:

1. In the studies on anaerobiosis, a combination of agar (0.1 percent) and sodium thioglycollate (0.1 percent) was found to be the most suitable in the subculturing experiments for maintaining a low oxygen tension, while for the turbidimetric studies, sodium thioglycollate (0.1 percent) was the most effective agent.

2. In the study on amino acid requirements, mediums containing the same concentration (1 percent) of several amino acid sources were compared. It was seen that the average length and number of spirochetes increased proportionately with turbidity, which itself increased with an increase in the concentration of the amino acid source. A chart is presented showing that *T. pallidum* will grow in mediums deficient in phenylalanine, glycine, valine, and aspartic acid for four subcultures and in mediums deficient in proline, glutamic acid, and alanine for six, seven, and eight subcultures, respectively.

3. In the serum albumin studies, it appeared that while albumin is essential for growth, its chief function may be as a protective agent against the fatty acids often present as contaminants in bacteriologic reagents.

4. The addition of glucose, using the same acid medium, was found to increase the growth of the spirochetes, the optimum concentration being 0.5 percent when autoclaved with the other components of the medium.

5. The vitamin studies showed that ascorbic acid and niacin, together with the other vitamins, will maintain growth in a peptone medium indefinitely.

Summarizing, this investigation revealed that the growth of *T. pallidum* can be maintained for nine subcultures in a medium consisting of a mixture of amino acids, sodium thioglycollate, glucose, vitamins, di-potassium phosphate, and serum albumin.

#### ARCH. DERMAT. & SYPH., CHICAGO

Cutaneous manifestations of gonococcal infection. Keratosis blennorrhagica treated with penicillin. John B. Miale and W. V. Singletary. 57: 151-157, Feb. 1948.

#### ARCH. OTOLARYNG., CHICAGO

Tertiary syphilis of ear, nose and throat. Abraham I. Goldner. Case Reports. 45: 463-466, Apr. 1947.

#### ARCH. SERV. SAN. L'ARMÉE BELGE, LIÉGE

Syphilis. Traitement mixte arsenobismuthique ou traitement bismuthique seul? [Arsenical bismuth, or bismuth alone, in the treatment of syphilis?]. P. Fernet. 99: 347-353, Nov.-Dec. 1946. [Abstracted in Bull. Hyg., London, 22: 451, July 1947.]

Les arsenones dans le traitement de la syphilis. [Arsenones in the treatment of syphilis.] Y. Bureau. 99: 355-364, Nov.-Dec. 1946. [Abstracted in Bull. Hyg., London, 22: 451, July 1947.]

#### BRIT. M. J., LONDON

Arsenical dermatitis successfully treated with BAL. J. Lawrence Reeve. Medical Memoranda. No. 4516: 132, July 26, 1947.

#### BULL. U. S. ARMY M. DEPT., WASHINGTON

Cardiolipin antigens in the serodiagnosis of syphilis. News and Comment. 8: 247-251, Apr. 1948.

\*Cardiolipin antigen in the Kolmer complement-fixation test for syphilis. J. F. Kent, H. M. Boyd and R. W. Sanders. 8: 284-293, Apr. 1948.

**Cardiolipin antigen in the Kolmer complement-fixation test for syphilis.** J. F. Kent, H. M. Boyd and R. W. Sanders. Bull. U. S. Army M. Dept., 8: 284-293, 1948.

The authors present a report on cardiolipin antigen which has been successfully adapted for use in the Kolmer complement-fixation test for syphilis. An analysis of its sensitivity and specificity as determined in parallel tests with Kolmer antigen is given. The reagents and techniques used in the performance of the Kolmer qualitative test were those prescribed for Army laboratories with the exception of one deviation in the method of diluting cardiolipin antigen.

The cardiolipin antigen that was selected for use in the Kolmer test contained cardiolipin (0.0175 percent), lecithin (0.0875 percent), and cholesterol (0.3 percent). Its optimal dilution for tests was established at 1:130 by repeated titrations with syphilitic serum and spinal fluid. It was found that this diluted antigen remained constant in its reactivity for periods of at least 8 hours and showed no undesirable anticomplementary properties.

In determining the sensitivity of the tests with Kolmer and cardiolipin antigen, specimens were obtained from patients with an established diagnosis of syphilis. The relative sensitivity of these tests was determined in parallel examinations of the same syphilitic serums and spinal fluids. Results showed a slight superiority in sensitivity and a lower incidence of doubtful reactions with cardiolipin antigen.

In determining specificity, serums were obtained from seronegative individuals without detectable evidence of disease and from patients with diseases other than syphilis. The serums from these individuals, which had given negative reactions in six other serologic tests for syphilis, were found negative also in the Kolmer test with cardiolipin antigen.

Ninety-nine specimens of serum from patients with active yaws showed the same relative reactivity in these tests as was observed with syphilitic serums.



Similar serologic findings had been obtained with yaws serums in a previous comparative study of microflocculation tests employing cardiolipin and ordinary tissue-extract antigens, it is noted.

The results of the test with cardiolipin antigen have shown a satisfactory degree of sensitivity in parallel tests with Kolmer antigen, and the introduction of quantitative methods for evaluating antigenic activity under the conditions of the Kolmer procedure have corroborated this finding, according to the authors. This report indicates that the specificity of the complement-fixation test with cardiolipin antigen has proved comparable and, in many instances, superior to that of the test with Kolmer antigen.

**CANAD. J. PUB. HEALTH, TORONTO**

Penicillin sensitivity of gonococci. Gordon H. Hawks and P. H. Greey. [Abstract of a paper presented at a meeting of the laboratory section, Canadian Public Health Association, Toronto, Dec. 15-16, 1947.] 39: 74-75, Feb. 1948.

The Mazzini microscopic flocculation test for syphilis used as a screen test. R. H. Allen and M. A. Mason. [Abstract of a paper presented at a meeting of the laboratory section, Canadian Public Health Association, Toronto, Dec. 15-16, 1947.] 39: 78-79, Feb. 1948.

**CANAD. M. A. J., MONTREAL**

The use of BAL (2,3 dimercaptopropanol) in arsenical encephalopathy. C. W. E. Danby. 58: 284-285, Mar. 1948.

**EAST AFRICAN M. J., NAIROBI**

Some aspects of penicillin therapy for early syphilis. P. Frankl. 24: 131-136, Mar. 1947.

Congenital syphilis in Uganda. E. M. K. Muwazi, H. C. Trowell and J. N. P. Davies. 24: 152-170, Apr. 1947.

Observations on single injections of penicillin with blood and its use in the treatment of acute gonorrhoea. R. M. Dowdswell. 24: 185-188, May 1947.

**INDUST. MED., CHICAGO**

Serological tests for industrial workers. Walter Clarke. 16: 538-539, Nov. 1947.

**J. A. M. A., CHICAGO**

\*The status of penicillin in the treatment of syphilis. [December 1, 1947.] Syphilis Study Section, National Institute of Health, U. S. Public Health Service. 136: 873-879, Mar. 27, 1948.

Transurethral resection for vesical dysfunction in cases of tabes dorsalis. John

L. Emmett and John B. Beare. 136: 1093-1096, Apr. 24, 1948.

Polymyxin. A note on experimental and clinical investigations. Emanuel B. Schoenbach, Morton S. Bryer, Eleanor A. Bliss and Perrin H. Long. 136: 1096-1098, Apr. 24, 1948.

Social hygiene in the Fort Knox experiment. Miscellany. 136: 1111, Apr. 24, 1948.

**The status of penicillin in the treatment of syphilis. [December 1, 1947.] Syphilis Study Section, National Institute of Health, U. S. Public Health Service. J. A. M. A., 136: 873-879, 1948.**

The purpose of this report is to summarize the principal facts of clinical importance with regard to penicillin in syphilis. Since 1943, at least 500,000 patients with syphilis in various stages have been treated with this antibiotic, the agent most employed in syphilotherapy in the United States today.

The intramuscular injection of penicillin in oil and wax, which has been found to be the only practical method in the treatment of syphilis, provides effectively bactericidal blood levels of at least three to five times the duration provided by aqueous penicillin in comparable dosage. This method does not require hospitalization and is therefore suitable for office or clinic administration. Although isolated instances of possible penicillin resistance have been reported in experimental rabbit syphilis and in clinical late benign gummatous syphilis, there is little evidence of the existence of penicillin-resistant disease analogous to arsenic- and bismuth-resistant syphilis or sulfonamide-resistant gonorrhea. In patients suspected of having syphilis, but previously treated with penicillin for infections other than venereal disease, it is suggested that treatment be based on the clinical aspects, examination of the spinal fluid, and the amount of penicillin already administered. In general, patients who have not received the minimum amount of therapy recommended for their type of syphilis should be re-treated.

Treatment schedules presently advised, on the basis of experimental and clinical research, were:

1. Early syphilis. Treatment with penicillin in aqueous solution, which necessitates hospitalization, should consist of 4.8 million units of penicillin G administered intramuscularly every 2 or 3 hours over a period of  $7\frac{1}{2}$  days. The failure rate in patients so treated averages about 10 percent. The recommended schedule for ambulatory treatment with crystalline penicillin in oil and wax consists of the intramuscular administration of 6 million units in 10 injections over a period of 10 days. Although adjuvant therapy with arsenic, bismuth, or fever is not advised as a first course of treatment, a combined therapeutic attack is sometimes advantageous in patients who have failed on an original course of penicillin.

2. Cardiovascular syphilis. Available information indicates that penicillin be withheld in syphilitic aortitis with aortic regurgitation, saccular aneurysm, or coronary disease until preparatory treatment with heavy metals has been given; five or more million units of penicillin should then be followed by small dosages (25,000 to 40,000 units) over a period of at least 15 days.

3. Neurosyphilis. A total of 4 to 10 million units of penicillin alone in aqueous solution, administered over a period of  $7\frac{1}{2}$  to 21 days and accompanying induced malaria fever, is suggested for patients with such types of neurosyphilis as early or late asymptomatic neurosyphilis, acute syphilitic meningitis, and vascular neurosyphilis. For patients with dementia paralytica, taboparesis, or primary optic atrophy, a total of 10 to 20 million units of penicillin, administered over a period of 12 to 20 days with induced malaria fever, is advised.

Presented in detail are suggestions for the posttreatment observation of pregnant syphilitic women and patients with early syphilis, infantile congenital syphilis, and neurosyphilis.

J. AM. PHARM. A. (PRAC. PHARM. ED.),  
EASTON

Present status of penicillin for oral administration. A. D. R. 9: 190-191, Mar. 1948.

J. BACT., BALTIMORE

The effect of sulfonamides on the action of

penicillin. Gladys L. Hobby and Martin H. Dawson. 51: 447-456, Apr. 1946.

Isolation of streptomycin-producing strains of *Streptomyces griseus*. Selman A. Waksman, H. Christine Reilly and Donald B. Johnstone. 52: 393-397, Sept. 1946.

The assay of antibiotic mixtures. F. J. Rudert, B. A. Kenner and Milton J. Foter. 53: 57-60, Jan. 1947.

Studies on some biological aspects of dihydrostreptomycin. Richard Donovick and Geoffrey Rake. 53: 205-211, Feb. 1947.

A mechanism for the development of resistance to streptomycin and penicillin. Morton Klein. 53: 463-467, Apr. 1947.

Studies on streptomycin. I. Factors influencing the activity of streptomycin. Sam Berkman, Richard J. Henry and Riley D. Housewright. 53: 567-574, May 1947.

Turbidimetric evaluation of bacterial disruption by sonic energy. [*Neisseria gonorrhoeae*.] R. F. Shropshire. 53: 685-693, June 1947.

Two antibiotics produced by a *Streptomyces*. P. C. Trussell, C. O. Fulton and Gordon A. Grant. 53: 769-780, June 1947.

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- The relative antisyphilitic activity of penicillins F, G, K, and X and of bacitracin, based on the amounts required to abort early syphilitic infections in rabbits. Harry Eagle and Ralph Fleischman. J. Bact., 55: 341-346, 1948.
- Penicillins, F, G, K, and X and bacitracin were given to rabbits beginning 4 days after intradermal inoculation with 2,000 organisms in an effort to establish the abortive doses of the drugs. This method of assay is based on the finding that a small amount of treatment will stop syphilitic infection in rabbits if it is given shortly after inoculation, before the appearance of a primary lesion. The relative antisyphilitic effects of a variety of compounds can be found by this means in 2 to 3 months rather than in 9 to 12 months, as in the determination of curative doses. The drugs in this study were injected intramuscularly once daily for 4 days.
- The amounts of penicillins F, G, K, and X and of bacitracin that aborted infection in half the animals were 3.5, 0.3, 2.6, and 2.2 mg. per kilogram, and 90 units per kilogram, respectively, by this method of assay. For penicillins F, G, K, and X, these represent gravimetric activities of 8, 100, 12, and 14, respectively, with reference to the activity of penicillin G as 100. For a bacitracin preparation assaying at 30 units per milligram, the activity would be 10 percent that of G; for a preparation containing 90 units per milligram, the activity would be 30 percent that of G.
- The authors state that the absolute and relative activities of these antibiotics show considerable variation, depending on the method of assay used. This statement is borne out by comparing the re-



sults of this study with others. In relation to penicillin G, penicillins F, K, and X and bacitracin were more active against the cultured Reiter strain in vitro than they were against the pathogenic *Treponema pallidum* in vivo. Penicillin G was the most efficacious of the antisyphilitic drugs studied, as is shown in the printed tables.

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YOUTH AFRICAN M. J., CAPE TOWN

The summarised findings of a medico-sociological investigation into the problem of prostitution in Johannesburg. Louis F. Freed. 22: 52-56, Jan. 24, 1948.

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TEXAS STATE J. MED., FORT WORTH

\*Serodiagnosis in syphilis. R. H. Kampmeier. 43: 577-581, Jan. 1948.

Gynecologic investigation of patients in State eleemosynary institutions. [Venereal disease.] Willard R. Cooke and John Dale Weaver. 43: 765-767, Apr. 1948.

Serodiagnosis in syphilis. R. H. Kampmeier. Texas State J. Med., 43: 577-581, 1948.

This article reviews serodiagnostic methods in syphilis, including a description of various types of tests and a section on the detection of false positive tests. The two types of serodiagnostic tests in general use for syphilis are the complement-fixation tests, especially the Eagle and Kolmer adaptations of the Wassermann reaction, and the flocculation reactions, such as the Kahn and Kline tests. The tests are all judged on the basis of their sensitivity (percentage of true positive reactions in serum from known syphilitic persons) and their specificity (percentage of negative results in serum from nonsyphilitic persons). High specificity rather than high sensitivity is the main aim of a serologic test. Generally, the flocculation reactions are more sensitive, but the complement-fixation tests are more specific. Quantitative determinations, indicated in conjunction with intensive antisymphilitic treatment, can be made on both types of tests by means of a series of dilutions.

The various stages of syphilis react differently to the serologic tests. For a short time after infection, the primary syphilis patient has a negative reaction until the quantity of reagin in the blood increases. Reactions in secondary syphilis have a 100-percent sensitivity. Late syphilis is not associated consistently with either positive or negative reactions, the reaction depending upon the form of the disease which is present. Serologic tests cannot be relied upon in untreated latent syphilis, as the results are variable. Treatment, if adequate, generally reverses a positive test, after a period of time, but some individuals show serofastness, a resistance to reversal of test results.

The author presents three main reasons for the occurrence of false positive tests; technical errors, presence of reagin in the blood of normal persons, and affliction with a nonsyphilitic disease which produces a positive reaction. Included in the last group are diseases due to pro-

tozoa, viruses, bacteria, and various other factors. So far, none of the verification tests developed have been completely satisfactory.

False positive tests should be suspected in the cases of virgins with no history of syphilis, especially congenital syphilis, and persons of both sexes, lacking histories of syphilis, who show positive tests at an interval following negative tests and who deny sexual exposure in the meantime. Persons without historical or clinical evidence of syphilis can be considered negative if their serum reactions are doubtful or slightly positive with the use of different methods of testing or different laboratories.

The author considers in detail the serodiagnosis of the individual patient. He suggests several means of validating a diagnosis of syphilis.

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Ocular affections of the newborn. [Including gonorrhea.] Frank D. Costenbader. 44: 36-40, Feb. 1948.

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Penicillin reactions. Comments on treatment. Harry Beckman. 47: 214, 259, Feb. 1948.

## CURRENT NOTES AND REPORTS

### Central American Congress

The Second Central American Congress of Venereology was held in Guatemala City, Guatemala, from April 26 through April 30, 1948. Officers of the Congress were Dr. Alejandro Palomo of Guatemala, president; Dr. Alejandro Bissot, Jr., of Panama, vice president; and Dr. Luis F. Galich of Guatemala, secretary.

The agenda of the Congress included discussions of penicillin therapy for syphilis, arsenotherapy, treatment of granuloma inguinale and lymphogranuloma venereum, the problem of prostitution, prenatal syphilis, and serologic studies.

Senior Surgeon Joseph S. Spoto, assistant chief of the Venereal Disease Division,

United States Public Health Service, gave an address on "Syphilis in One World." The following staff members of the Venereal Disease Research Laboratory also delivered papers: Senior Surgeon R. C. Arnold, "Penicillin Therapy of Early Syphilis"; Surgeon John C. Cutler, "Serologic Patterns in Syphilis"; Surgeon Sacha Levitan, "The Clinical Manifestations of Syphilis"; Joseph Portnoy, serologist, "Serology in Syphilis" and, with the assistance of Dr. Juan M. Funes, chief of the Guatemala Venereal Disease Section, "Serological Investigations in Central America."



## Treatment Records Available to Physicians

The Veterans' Administration has in its custody the majority of syphilis records of those Army personnel who were treated for this disease while in active service, and in many instances can procure informative data from the syphilis records of other than Army personnel. It is thought that many physicians treating veterans for syphilis as private patients would find a résumé of the syphilis record useful since the details of treatment, results of spinal fluid examinations, and blood serologies are incorporated in the records.

Résumés of these records are available to physicians who are treating such veterans provided authorization for the release

of the data is given by the veteran. Requests for the résumés accompanied by an authorization for the release of the data, dated and signed by the veteran, should be addressed to the Dermatology and Syphilology Section, Veterans Administration, Munitions Building, Washington 25, D. C. It is most important that the veteran's service serial number and other identifying information, such as the date of enlistment, the date of discharge, rank, and organization, be included.

Ordinarily, the résumés can be furnished in approximately 2 weeks from the date of the receipt of the request and signed authorization.

## Educational Experiment in Ohio

The *Columbus Star*, a tabloid-type newspaper with a State-wide distribution, recently completed a series of 24 weekly articles on venereal disease. They were prepared by Community Health Services, a Columbus health education agency, in cooperation with the Central Ohio Rapid Treatment Center. The articles were presented as case histories of actual patients treated at the Center, and each story was designed to illustrate a particular factor of the venereal disease problem.

Consequently, more than 8,000 pieces of literature were distributed as a result of requests addressed to the *Star*. These requests came, for the most part, from individuals, but many requests were also

received from such groups as boys' and girls' clubs, school and church organizations, and labor unions. Letters were received from 246 communities in Ohio outside Columbus, and from 81 of the 88 counties in the State, as well as from 22 different cities in nine different States outside Ohio.

Further response was noted by the health center in Columbus, and by health officers and public health nurses in other Ohio communities, in the number of clinic visitors who, inspired by the series, requested blood tests. Private physicians also reported an increase in the number of patients who requested diagnostic examinations for syphilis.

**Cases of Syphilis and Gonorrhea Reported to the United States Public Health Service by State and Territorial Health Departments, Second and Third Quarters of Fiscal 1948**

[Known military cases excluded]

Area	Syphilis										Gonorrhea					
	Primary-secondary			Early latent			Late and late latent			Congenital			Not stated			
	Octo-ber-December 1947	Janu-ary-March 1948	Trend ratio	Octo-ber-December 1947	Janu-ary-March 1948	Trend ratio	Octo-ber-December 1947	Janu-ary-March 1948	Trend ratio	Octo-ber-December 1947		Janu-ary-March 1948	Trend ratio	Octo-ber-December 1947	Janu-ary-March 1948	Trend ratio
District 1—Total	3,354	2,724	0.81	4,146	3,839	0.93	7,370	7,382	1.00	457	528	1.16	366	297	0.81	
Connecticut	69	48	.70	94	71	.76	148	123	.83	11	15	(a)	53	37	.70	
Delaware	66	72	1.09	81	60	.74	42	62	1.48	8	3	(a)	54	56	1.04	
Maine	133	94	.71	27	30	1.11	83	70	.84	12	4	(a)	9	0	(a)	
Massachusetts	218	181	.83	118	76	.64	417	306	.73	49	43	.88	0	0	(a)	
New Hampshire	15	15	(a)	4	11	(a)	35	39	1.11	9	9	(a)	1	0	(a)	
New Jersey	370	306	.83	655	663	1.01	833	719	.86	37	53	1.43	17	8	(a)	
New York	1,400	1,307	.90	1,689	1,751	1.04	4,579	5,001	1.09	197	241	1.22	75	63	.84	
New York City	1,158	1,087	.94	1,529	1,644	1.08	3,431	4,080	1.19	138	187	1.36	22	42	1.91	
Pennsylvania	983	689	.67	1,447	1,153	.80	1,137	940	.83	124	140	1.13	74	29	.39	
Philadelphia	435	281	.65	965	754	.78	685	669	.98	44	47	1.07	123	36	.29	
Pittsburgh	174	140	.80	95	133	1.40	148	170	1.15	18	35	(a)	0	0	(a)	
Rhode Island	21	17	.81	23	24	1.04	83	105	1.26	8	18	(a)	36	52	1.44	
Vermont	19	25	(a)	8	0	(a)	13	17	(a)	2	2	(a)	47	52	1.11	
District 2—Total	3,655	3,571	.98	3,583	3,460	.97	2,663	2,468	.93	410	388	.95	204	100	.49	
District of Columbia	400	274	.68	356	274	.77	320	304	.95	47	30	.64	14	0	(a)	
Maryland	482	507	1.03	446	494	1.11	605	567	.94	52	68	1.31	119	45	.38	
Baltimore	362	351	.97	332	386	1.16	513	449	.88	29	36	1.24	34	27	.79	
North Carolina	821	870	1.06	806	728	.90	295	241	.82	89	80	.90	0	0	(a)	
South Carolina	592	669	1.13	635	733	1.15	345	300	.87	55	73	1.33	0	0	(a)	
Virginia	803	730	.91	985	815	.83	696	529	.76	110	78	.71	71	55	.77	
West Virginia	547	521	.95	355	416	1.17	402	527	1.31	57	59	1.04	0	0	(a)	
District 3—Total	4,090	3,721	.91	4,743	4,268	.90	6,236	6,122	.98	612	597	.98	629	462	.73	
Illinois	1,166	1,194	1.02	1,407	1,311	.93	2,021	1,818	.90	149	147	.99	0	1	(a)	
Chicago	714	750	1.05	1,034	974	.94	1,231	1,036	.84	88	81	.92	0	1	(a)	
Indiana	421	445	1.06	255	286	1.12	399	541	1.36	40	74	1.85	0	1	(a)	
Kentucky	489	553	1.13	435	376	.86	481	480	1.00	56	61	1.09	141	54	.38	
Michigan	739	585	.79	892	811	.91	1,385	1,471	1.06	127	114	.90	406	406	.84	
Ohio	1,205	800	.67	1,633	1,366	.84	1,728	1,586	.92	222	173	.78	0	0	(a)	
Wisconsin	63	84	1.20	121	118	.98	222	226	1.02	18	28	(a)	5	0	(a)	
District 4—Total	5,471	5,423	.99	6,826	6,707	.98	7,108	8,222	1.16	778	1,111	1.43	1,599	1,501	.94	
Alabama	1,006	593	.59	1,820	1,047	.58	2,501	1,472	.59	32	101	1.10	1,145	1,053	.92	
Arkansas	549	595	1.08	757	1,192	1.57	1,256	3,166	2.52	208	414	1.99	1,15	1,50	.91	
															.69	
															.88	







# *The* JOURNAL of VENEREAL DISEASE INFORMATION

Volume 29

September 1948

Number 9

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FEDERAL SECURITY AGENCY  
PUBLIC HEALTH SERVICE

### **Submission of Manuscripts**

In order to facilitate the handling of manuscripts submitted for publication in the JOURNAL OF VENEREAL DISEASE INFORMATION, the editor requests that copy be prepared in triplicate, typewritten, double-spaced, with liberal margins. Statistical tables and charts should be set up according to the style used in the JOURNAL, and should be presented on separate sheets, rather than within text material.

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**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office  
Washington 25, D. C. - Price 10 cents. Subscription Price: Domestic, 75 cents  
a year; foreign \$1.15**



# Case Holding in the Clinic

David Frost, M. D.,<sup>1</sup> Health Officer, City of Alameda, California

Experience with nearly 1,000 syphilis patients in the City Clinic of Oakland, Calif., demonstrates that it is possible to run an efficiently operated clinic, using the new penicillin therapy, to complete treatment in 98 percent of the cases with comparatively little of the expensive case-holding field work which has marked the operation of clinics in the past.

Oakland's experience indicates that with modern treatment methods the expensive hospitalization involved in the operation of rapid treatment centers may no longer be necessary in order to complete adequate therapy with syphilis patients in large urban communities.

Under the old 18-month block plan of treatment, it was the almost universal failure of clinics to hold the majority of their patients for completion of treatment which led to the development of the rapid treatment center and the quick acceptance of the work of Hyman (1), Margin (2), and Leifer (3). Only 1 out of every 5 patients who started that month clinic treatment completed it. Only 1 out of 4 patients received the minimum regimen of 20 arsenical and 2 bismuth injections.

With such a record in the clinics, the rapid treatment center seemed to be the answer to the problem of case holding, or the keeping of the patients until medical care until treatment was completed. Case holding had become one of the major expenses in syphilis treatment. It dissipated a large percentage of the time of clinic and field personnel. And even after huge expenditures on case holding, the results were far from satisfactory. Furthermore, the rapid treatment center seemed to be the answer to the problem of treatment reactions and the technical difficulties incident to

the administration of such intensive arsenotherapy.

However, the rapid treatment center is not the whole solution to the problem because it represents a tremendous expense either to the community or to the patient. Certainly if patients can be treated as effectively and as completely in the clinic it would be desirable to keep them there in the first place.

Many workers (4, 5) have now demonstrated that penicillin in oil-beeswax is effective in treating syphilis. It still remains to be shown that the clinic can approach the rapid treatment center record in holding patients for the completion of treatment. On that problem the experience of the Oakland City Clinic between May 12 and December 31, 1947, is important.

During those months, the Oakland City Clinic represented the only official Health Department venereal disease clinic available to the 700,000 people in Alameda County, Calif. There were in 1947 an average of 6,000 patient visits per month. An average of 81 new cases of syphilis and 230 new cases of gonorrhea were diagnosed each month during that year. Each patient was seen by a physician at each clinic visit. Complete venereal disease diagnostic studies were made by physicians who ordered all treatment. Registered nurses administered all drugs. Patient education and contact investigation on all diagnosed cases were done by two public health nurses and one investigator. Four male investigators handled the field work of the infectious cases. The field work on the noninfectious cases was done by public health nurses who carried on a generalized program in their districts.

The handling of the patient within the clinic was geared so that his waiting time was reduced to the absolute minimum. Charts of patients undergoing a

<sup>1</sup>Formerly Venereal Disease Control Officer, Oakland, Calif.

course of therapy for syphilis or returning for posttreatment observation were processed separately from those who appeared for the first time, or who returned for additional diagnostic work-up. The patient who was on a course of therapy received priority. He was interviewed for treatment reactions by a physician. If there were no reactions, he was sent to the treatment room where specially trained registered nurses administered the prescribed drugs. If the patient had a treatment reaction, he was examined privately. Posttreatment observation of the patient was handled in the same expeditious manner as the course of treatment.

Aside from the venereal disease control officer, there were one full-time and five part-time physicians on the clinic staff during the study. Two of the part-time clinicians were diplomates of the American Board of Dermatology and Syphilology. There was no definite specialization within the clinic, all clinicians performing all types of clinical duties. New diagnoses of syphilis were reviewed by the venereal disease control officer, who was also the clinic director. Frequent staff meetings were held so that the physicians managed the cases along the accepted line adopted by the group. The course of therapy for cases of neurosyphilis was outlined only after consultation by two or more members of the group. The physicians were instructed to deal with patients as courteously as they cared for their private patients.

To assist the nurses in keeping the supplies in good shape, a nurse's assistant was used. She took great pride in having sharp needles at all times. Only minimal pain was associated with therapy by the patients because of her efforts. Due to the great flow of patients through the clinic, the nurses were very adept at intravenous and intramuscular technic, priding themselves on their skill.

The plans of therapy used were either a 10-day plan of a single injection of POB daily combined with 5 arsenical and 3 bismuth injections or a 24-day plan of a single injection of POB daily combined

with 12 arsenical and 6 bismuth injections, depending upon the nature of the case. The shorter treatment was used on all syphilis patients except for those with neurosyphilis, cardiovascular syphilis, or prenatal syphilis. The 24-day therapy was used on the neurosyphilis patients only.

At the time of diagnosis, the physician outlined the course of therapy to be employed and usually pencilled onto the treatment sheet what the patient was to receive. The patient was then interviewed by one of the public health nurses. After discussing the mode of transmission, signs, and symptoms of the disease, the nurse told the patient again what type of treatment he was to receive, using the treatment sheet for a visual demonstration. Of course, treatment reactions were discussed, and contact information was given. At the end of the interview, the nurse took the patient to the treatment room, with the indicated prescribed therapy to be received that day, and the registered nurse administered the drugs.

All the registered nurses in the treatment room were instructed to remind the patient that he was to return again the following day. This reminder and encouragement was a routine procedure for all clinic personnel who saw the patient on treatment. On the last day of the treatment period, the patient was again interviewed by the public health nurse. This time, after reviewing contacts, signs, and symptoms, the nurse read and discussed the contents of a mimeographed sheet of simple, understandable instructions to the patient regarding the stage of syphilis he had, the amount of treatment he had received, and the need for continued subsequent observation in the future. A specific appointment for the next visit was made during the interview and the patient was given the mimeographed instructions.

The clinic was open weekdays between 8:30 a. m. and 5:00 p. m., and patients on treatment or posttreatment observation were cared for at any time between those hours. Patients often received treatment and departed within 15 minutes from the time they entered the clinic.

any patients relied on this rapid type of service and appeared during the lunch hour.

## Results

During the last 7½ months of 1947, 100 syphilis patients were treated at the clinic. Table 1 shows the effectiveness in case holding. Note that approximately 80 percent completed treatment. Four percent of five did not miss one clinic appointment; approximately 11 percent missed one; about 4 percent missed either two or three; and about 2 percent missed four or more appointments. Seven patients (less than 1 percent) required a second course to complete therapy. Field

visits were needed for only 35 of the patients, which is about 4 percent of the total.

The reasons given by the patients requiring a second course to complete treatment or failing to complete it are given in table 2. The transportation strike referred to continued for a period of 17 days and, although it resulted in a fair number of lapses and the need for four patients to take a second course to complete therapy, it did not cause any of them to fail to complete treatment altogether. Treatment reactions accounted for a surprisingly small number of this group of failures since allergic reactions were controlled by pyribenzamine and benadryl.

Table 1.—Effectiveness of case holding during treatment for syphilis with POB, May 12 to December 31, 1947, Oakland City Clinic

Number of lapses from scheduled treatment visits	Total patients (all schedules)		Patients on 10-day <sup>1</sup> schedule		Patients on 24-day <sup>2</sup> schedule	
	Number	Percent	Number	Percent	Number	Percent
None.....	766	80.46	693	82.20	73	66.97
1.....	101	10.61	85	10.09	16	14.68
2.....	41	4.30	34	4.03	7	6.42
3 or more.....	16	1.68	9	1.07	7	6.42
Total completing treatment.....	924	97.05	821	97.39	103	94.49
Required second course to complete therapy.....	8	.84	8	.94	6	5.51
Failed to complete a course of therapy.....	20	2.11	14	1.67	6	5.51
Grand total.....	952	100.0	843	100.0	109	100.0

<sup>1</sup>300,000 units POB daily combined with 5 arsenicals and 3 heavy metals.  
<sup>2</sup>300,000 units POB daily combined with 12 arsenicals and 6 heavy metals.

ve patients disappeared entirely before completing therapy; and four moved out of the clinic's jurisdiction but were followed by health departments in their new homes.

Table 3 compares the effectiveness of case holding while on ambulatory POB plans of therapy for syphilis with the previous experience of the clinic while using arsenobismuth plans. Experience at the Oakland City Clinic indicates that when the plan of treatment was of relatively short duration, the case holding was better. About 65 percent of the patients who started on the 26-week Army

plan completed it, and 72 percent of those on the 10-week Eagle-Hogan plan completed that schedule; but 94½ percent of the patients who started on the 24-day ambulatory plan completed it, and 98 percent of those on a 10-day ambulatory plan completed that course. Although the differences between the Army and the Eagle-Hogan plans are not statistically significant, since there are a small number of patients in the series, there is a statistically significant difference between the percentages of the 10-day plan, the 24-day plan, and the arsenobismuth plans.



**Table 2.—Reasons for lapsing from scheduled POB treatments for syphilis, May 1 to December 31, 1947, Oakland City Clinic**

Reason for lapsing	Required second course to complete therapy	Failed to complete treatment
Public transportation strike.....	4	
Treatment reaction.....	1	
Uncooperative.....		
Discontinued POB because of job.....	1	
Thought treatment had been completed.....	1	
Pregnant—treated after delivery.....	1	
Unable to locate.....		
Moved out of jurisdiction.....		
Referred to private physician.....		
Asthmatic attack.....		
Broken leg.....		
Hospitalized for unrelated condition.....		
Hospitalized for in-patient treatment <sup>1</sup> .....		
Total.....	8	

<sup>1</sup> Counted as “failed to complete treatment” in this study, because ultimately completed treatment was ambulatory.

**Table 3.—Comparative effectiveness of case holding with selective plans, Oakland City Clinic**

Treatment schedule	Total patients	Number completing treatment	Percent completing treatment
26-week Army plan <sup>1</sup> (40 arsenic, 16 bismuth).....	102	66	64.7
10-week Eagle-Hogan plan <sup>1</sup> (30 arsenic, 10 bismuth).....	253	183	72.3
24-day ambulatory POB <sup>2</sup> (12-72-6).....	109	103	94.5
10-day ambulatory POB <sup>3</sup> (5-30-3).....	843	829	98.3

<sup>1</sup> July 1 to Dec. 31, 1946.

<sup>2</sup> May 12 to Dec. 31, 1947: 12 arsenic; 7.2 million units POB, 6 bismuth.

<sup>3</sup> May 12 to Dec. 31, 1947: 5 arsenic; 3 million units POB, 3 bismuth.

**Discussion**

Oakland's success in holding 98 percent of the patients to completion of treatment indicates that the rapid treatment center is not necessary to complete adequate therapy in syphilis patients in large urban communities at the present time. The clinic was treating the regular run-of-the-mill venereal disease patients. About 80 to 85 percent of the patients were Negroes. Certainly, the good courteous service, with the minimal waiting period, were important factors in the case holding.

Table 3 merely substantiates what most

venereal disease control officials have suspected, namely, that the shorter the treatment plan, the more cooperative the patient.

The fact that field work was needed in less than 4 percent of the patients on ambulatory POB plans is important. Heretofore, a much larger percentage of patients required field work. In our series of 355 patients on arsenobismuth plans, representing our previous experience, 66 patients (18.6 percent) required field work. The saving of personnel time, in the clinic and field, incident to the short plans of therapy can be used to improve case finding.

## Summary

1. Approximately 98 percent of 952 patients who started on ambulatory POB of treatment completed them. Eighty percent missed no clinic appointments. Field work was required on 35 patients in order to return them to treatment. Evidently, the shorter the plan of treatment, the more cooperation from the patient.

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# Stabilized Citrate Gold for Use in the Colloidal Gold Reaction<sup>1</sup>

Carl Lange and Albert H. Harris

The standardization of the colloidal gold reaction (1, 2) has been of great practical value in the evaluation of the findings obtained with cerebrospinal fluid specimens. The gold sol as previously prepared (3), however, was relatively unstable. This difficulty has now been overcome (4), and the present report describes the methods used in preparing stable sols and the techniques that have been developed for selecting sols of optimum sensitivity.

## Preparation of Stabilized Citrate Gold Sol

*Use of turbidity determinations in selecting sols of optimum sensitivity.*—Gold sols that are optimally sensitive elicit a turbidimetric reading of approximately 30 in the particular Klett-Summerson photoelectric colorimeter employed in

cerebrospinal fluid work in this laboratory; red filter No. 66 is used. This value will not necessarily be the same when other, even though similar, colorimeters are employed. They can be calibrated through the use of a permanent red color standard (5) prepared as follows: Fifty grams of cobalt chloride are dissolved in 1-percent hydrochloric acid, made up to 250 ml. in a volumetric flask. This reproducible standard was found to yield, in each of two Klett-Summerson colorimeters used for comparison, a reading of 116 with red filter No. 66. A calculation can be made for any colorimeter of this type by means of the following ratio:

$$\frac{X}{\text{Colorimeter value of the standard cobalt chloride solution}} = \frac{130}{116}$$

X is the equivalent value in the colorimeter being calibrated that will be found on testing the turbidity of sols of optimum sensitivity.

<sup>1</sup> From the Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.

*Preparation of distilled water.*—Freshly redistilled water is used for preparing the citrate gold sol 1:10,000. Tap water is first distilled in a Barnstead still, yielding "ordinary" distilled water, which invariably contains impurities that cause the turbidity (sensitivity) of the citrate gold sol to be markedly below the optimum. To remove these impurities, this water is next treated with alkaline permanganate; to an 8-liter pool of "ordinary" distilled water are added 10 ml. of 40-percent sodium hydroxide and 10 ml. of 1-percent potassium permanganate. At the end of 1 week's storage, the organic material is largely oxidized. The water is then redistilled in a special still assembled entirely of pyrex glass (2, 6). Occasionally, seasonal disturbances have necessitated triple distillation.

A source of pure spring water is available not far from this laboratory. Single distillation in the pyrex still, after permanganate treatment, has yielded water of excellent quality.

*Production of batches of gold sol.*—To secure fairly uniform gold sols, a pool of freshly redistilled water (6) is accumulated sufficient for from six to eight batches of the sol. A constant, 1,500-ml. volume of the redistilled water is employed in preparing each batch. The boiling is done in a 2-liter Florence flask of pyrex glass, which is used exclusively for this purpose. When the water comes to a rolling boil, 10 ml. of 1.5-percent acid gold chloride (Baker purified) are added by means of a bulb pipette and the fluid is mixed by twirling; then 10 ml. of 1.5-percent sodium citrate T. P. are added and mixed. (The 1.5-percent citrate solution deteriorates rapidly; it is freshly prepared from 30-percent solution that is kept in the refrigerator and renewed every month.) As the boiling continues, the gold chloride undergoes reduction; the fluid assumes a bluish color, which rapidly deepens and then changes abruptly into the red of the completely reduced gold sol. After this color change, the boiling is continued, with lower flame, for about 2 minutes. The turbidity is immediately determined, while the fluid is still

hot. Batches yielding values ranging from 110 to 150 (by means of the electro photometer) are adequate for pooling.

If the boiling time of 2 minutes has yielded a sol of comparatively low turbidity, approximately 110, a higher figure may be obtained in subsequently prepared batches by reducing the boiling time, but not below 1 minute. Inversely, if the turbidity is as high as 150, the boiling time may be increased, up to 4 minutes. Different pools of redistilled water may yield sols of different turbidities. Even when identical reagents are used in preparing two or more batches of sol, differences in turbidity readings up to 20 points are found. A fair degree of uniformity in the turbidity is most easily secured by pooling several batches of gold sol.

When the sensitivity of sols is unsatisfactorily low, the fault usually lies either in uncleanness of the Florence flask or most commonly, in impurity of the water. Such sols are characterized by a turbidity below 110. When they occur even after the postreduction boiling time has been shortened to 1 minute, the Florence flask must be cleaned with aqua regia (1, 6). If the turbidities of batches subsequently prepared continue to be too low, impurity of the water will most likely prove to be the cause. If such failures occur only sporadically, the water should be discarded, and a fresh, similarly prepared pool of distilled water may then be tried. If, however, these failures occur repeatedly, as may happen during seasonal turn-overs, a third distillation in the pyrex still is indicated. Difficulties that persist after these measures have been tried are indicative of a faulty still or of a wholly unsatisfactory source of water.

*Stabilization of the individual batches of gold sol before pooling.*—Each batch of the acid citrate gold sol 1:10,000 is stabilized by approximate neutralization. Three points are significant in regard to this stabilization: (1) Equilibrium is reached almost immediately by the use of 1-percent anhydrous sodium carbonate. However, if sodium hydroxide is used



), the reaction is delayed about 1 week owing to slow absorption of carbon dioxide from the air. (2) The duration of stability depends on the pH of the approximately neutralized gold sol. At a pH of about 6.8 the gold sols seem to remain unchanged for a longer period than at pH 7.4. (3) The maintenance of stability also depends to a large extent on the scrupulous cleanliness of the storage flask.

When the 1,500-ml. batches are prepared, about 50 ml. are lost by evaporation; a similar amount is used to rinse the freshly steamed 2-liter pyrex bottle, with its glass stopper, into which the sol is poured for temporary storage. Accordingly, the volume of each batch decreases to approximately 1,400 ml. The amount of carbonate to be added to the acid citrate gold sol depends upon the volume, which for practical purposes may be considered to be constant (1,400 ml.) and on the pH, which ranges from 3.9 to 4.3, depending on the varying acidity of the acid gold chloride used. As long as the same stock solution of gold chloride is employed, the amount of sodium carbonate to be added will not vary. For this reason, whenever the stock solution of 1.5-percent gold chloride needs replenishing, comparatively large amounts are prepared. This solution, when stored in a brown bottle with glass stopper, keeps indefinitely. The pH of the acid citrate gold sol prepared with gold chloride (as used in this laboratory) is 3.9. Despite the simplicity of the procedure, the addition of 6.0 ml. of 1-percent anhydrous sodium carbonate to the batches of gold sol of approximately 1,400-ml. volume, prepared with this particular gold chloride solution, has yielded, with only slight deviations, a pH of 6.8. The pH of the neutralized citrate gold sol may be checked potentiometrically or colorimetrically, a procedure that is necessary with the introduction of a new solution of gold chloride requiring a newly determined amount of sodium carbonate.

The colorimetric check is performed in a comparator block in which the first tube in front contains 5 ml. of the approxi-

mately neutralized citrate gold sol plus 0.2 ml. of bromthymol blue indicator, while the corresponding rear tube contains a blank consisting of water; the second tube in front contains gold sol, and is backed by a tube containing 5 ml. of phosphate buffer, pH 6.8, plus 0.2 ml. of indicator. If the pH of the sol proves to be other than 6.8, an adjustment must be made in the amount of sodium carbonate used for neutralization. The phosphate buffer, pH 6.8, is easily prepared as follows: 4.55 gm. of anhydrous potassium acid phosphate ( $\text{KH}_2\text{PO}_4$ ) and 4.75 gm. of anhydrous disodium phosphate ( $\text{Na}_2\text{HPO}_4$ ) are weighed on a torsion balance (capacity 120 gm., sensitivity 2 mg.) and each is dissolved in pure, redistilled water added up to a volume of 1,000 ml. Satisfactory anhydrous buffer salts may be obtained from different commercial companies. The photoelectric colorimeter used to check the buffer solution must be calibrated just once by means of a buffer of pH 6.8 that has been checked potentiometrically. The indicator consists of 0.30 gm. of metanitrophenol dissolved in distilled water; the solution is made up to 100 ml. in a volumetric flask. Five milliliters of buffer plus 1.0 ml. of indicator solution yielded a reading of approximately 110, with blue filter No. 42, in the Klett-Summerson colorimeter used in cerebrospinal fluid work in this laboratory. Whenever a new indicator solution is prepared, it must be compared colorimetrically with the old one, and if a different colorimeter is used, it must be calibrated.

Individual sols showing a turbidity of from 110 to 135 are neutralized immediately after preparation; if the turbidity is higher than 135 it may be decreased by delaying the neutralization for several hours or overnight. The final turbidity of the pooled batches of gold sol can be calculated before they are combined; it is equivalent to the arithmetical mean of the turbidities of the individual batches. In view of this fact, pools with values in the optimum range from 120 to 140 can be readily prepared.

*Storage of the pools of gold sol.*—After

the individual batches are neutralized and pooled, they are stored in 9-liter pyrex bottles stoppered with corks covered with cellophane. The storage bottles are kept at room temperature, and are protected from the direct rays of the sun. Turbidity measurements repeated from time to time serve to check the stability of the sols. The turbidity may remain unchanged for 3 months or more. If, however, the turbidity decreases by more than 10 points in a short time, rapid deterioration (recognizable by a visible precipitate) may take place, under which circumstances such gold sols are to be discarded. Such deterioration is almost exclusively due to unsatisfactory cleaning of the storage bottles, a factor of highest importance. These bottles must be cleaned with aqua regia (1, 6). Afterward, all traces of the acid must be removed by thorough rinsing with large volumes of tap water, followed by two or three rinses with distilled water, and, finally, by steaming for at least 30 minutes. The steaming is accomplished by inverting the bottle over a vertical glass tube attached by a cork stopper to a flask of boiling water.

Stored sols may yield quantitatively identical results over a period of 3 months or more. Eventually, they will deteriorate, but if they remain stable for 4 weeks, practical requirements will have been fulfilled. In this laboratory, about 500 specimens per month are currently being examined, with the result that 9- to 10-liter pools of gold sol are exhausted in less than 4 weeks. The amount of sol needed in laboratories in which a smaller number of specimens is examined will, of course, be less; in many cases, one 1,400-ml. batch will probably prove to be adequate. Unless this minimum amount is regularly consumed in a period of 4 weeks, the number of specimens received must be so small that the undertaking of complete routine cerebrospinal fluid examinations would probably be inadvisable. In any event, since difficulties can more easily be avoided through the preparation every month of an adequate supply of stabilized citrate gold, unused sols should be dis-

carded when 4 weeks old. Preparation of a new sol is much easier than readjustment of aged preparations.

## Discussion

Colloidal gold must fulfill certain requirements in order to be satisfactory. It must be sensitive, reasonably stable, reproducible, and easily prepared. Citrate gold sol prepared by reduction with sodium citrate in a concentration of 1:10,000 is optimally sensitive in a milieu adjusted to the obligatory pH of 7.4. The superior sensitivity is most strikingly revealed in the differentiation between cerebrospinal fluids that are normal and those that are slightly abnormal. Highly dispersed, crystal-clear gold sols remain unchanged during prolonged storage but are so insensitive that they are worthless for diagnostic purposes. Sensitive sols, on the other hand, tend to be relatively unstable at the low pH at which reduction takes place. This deficiency has been met by approximate neutralization of the gold sol after preparation. The production of satisfactory colloidal gold by the method described is easy and failures are rare; in fact, the preparation is much easier than the detailed description would suggest. By means of strict, quantitative controls, involving turbidimetry and a test fluid, repeated checks are made of each batch of the sol. Generally, no alteration can be demonstrated over a period of 3 months or longer; mailing appears to have no effect on the stability. It is, therefore, possible to distribute the reagent to diagnostic laboratories with small staffs in which the preparation of a quantitatively standardized gold sol cannot be conveniently undertaken. It is an all-purpose sol; it can be used for qualitative and quantitative tests on cerebrospinal fluid as well as for tests on blood serum.

## Summary

The preparation of stabilized colloidal gold for use in quantitative or qualitative

tests is described. This sol is superior to any colloidal gold preparation or colloidal substitute thus far described, with respect to simplicity of preparation, sensitivity, stability, and reproducibility.

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# Efficiency of Penicillin in Gonorrhea, Analyzed by Sampling Method<sup>1</sup>

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M. E. Laughlin, M. S., Statistician

Analysis by the sampling method of a study of 33,738 cases of gonorrhea, treated at the Municipal Social Hygiene Clinic of the Chicago Health Department with single injections of 200,000 units of penicillin in oil and beeswax on an ambulatory basis, indicates that the treatment was so efficient and effective that the failures are approximately only 2 percent.

Since the discovery of penicillin and its application in the treatment of acute gonorrhea, the literature has had many reports concerning its efficacy. Romansky and Rittman (1) reported their suspension of penicillin in oil and beeswax and effective prolongation of blood levels for a period of 24 hours after one injection. A second series of articles has

appeared in numerous periodicals, claiming a high percentage of cures in the treatment of gonorrhea. Most of these articles were written by venereal disease specialists, and their results were based upon investigations done in large hospitals and clinics. It is obvious today that penicillin in oil and beeswax is a successful short treatment in gonorrheal infections. Meads and Finland (2) published an analysis of the results of penicillin in the treatment of gonococcal infections as reported in the literature through 1945. They collected and analyzed 21,936 cases which included all known treatment methods. From this study there were 1,045 cases from three different clinics which received 200,000 units of penicillin in oil and beeswax once a day, with an average cure rate of 90 percent.

From the Venereal Disease Control Program of the Chicago Health Department, in cooperation with the United States Public Health Service. Under the direction of Herman N. Edesén, Senior Surgeon (R) (Inactive) U. S. Public Health Service; President, Chicago Board of Health.

The new study, based on the experience of the Chicago Health Department, is even more convincing. All 33,738 cases were from one clinic served by one laboratory. The cure rate—even higher than those



reported by Meads and Finland—indicates that we have reached a satisfactory point in the treatment of gonorrhea from the public health point of view.

Furthermore, it shows the general practitioner the value of penicillin, in absorption-delaying vehicles, in the treatment of acute gonorrhea. It is the family doctor to whom many patients turn for diagnosis and treatment. If he can save time in treatment he can be an efficient epidemiologist in ferreting out contacts, since he has gained the fullest confidence of his patients by a quick and effective cure.

### Material

The Chicago Health Department, during the period from July 1, 1945, to December 31, 1946, received morbidity reports of 42,185 gonorrhea cases. Non-health department agencies sent 7.7 percent; private physicians sent 10.1 percent; while the rest, 82.2 percent, were cases reported by the four Chicago Health Department clinics.

The Municipal Social Hygiene Clinic of the Chicago Venereal Disease Control Program, over a period of 18 months, from July 1945 through December 1946, treated 33,738 cases, of which 23,386 were male and 10,352 were female patients.

During each patient's initial examination a blood specimen for serologic test for syphilis was drawn, and a smear obtained from the urethral discharge. In the case of a female a smear from the cervix and a culture also were taken. After the diagnosis of acute gonorrhea was established, the patient received 200,000 units of penicillin in oil and beeswax in the outer, upper quadrant of the buttocks. He was then referred to a trained epidemiologist for an interview as to the source of infection and other contacts. All patients were instructed to return to the clinic after 2 days for a checkup, which consisted of a culture from the urethra, or, in the case of a female, from the cervix. They returned after 1 week for their second posttreatment culture and another blood serology. The patient was asked to report each

month for 3 months for examination and serologic tests for syphilis. This was done to discover syphilis in case of concomitant infections.

### Method

In order to avoid the difficult task of reviewing thousands of charts, a random stratified selection was employed, taking into consideration age, sex, and color as determined from the gonorrhea morbidity reports by the Chicago Health Department clinics. In determining the size of the sample, certain assumptions were made. It was assumed that the failure rate could be as high as 10 percent, as found in Meads and Finland's analysis of the results published in the recent literature.

Two samples of 500 charts<sup>2</sup> each were drawn from the files at random in the following manner:

Sample 1 was drawn entirely from the inactive charts of patients who had not reported to the clinic for examination within 6 months before the sample was taken.

Sample 2 was drawn from the active and inactive files in order to obtain data on reinfection rates. It was also felt that by taking the present active file, we might possibly be able to determine whether we already had run across a penicillin-resistant strain of gonorrhea.

In sample 1, the records revealed that of the 500 cases treated for gonorrhea 79.6 percent reported for a postpenicillin

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<sup>2</sup> From the formula  $\sigma = \sqrt{\frac{p \times q}{N}}$

we should be able to determine the size of the sample needed:

(The standard deviation is equal to the square root of the failure rate times the rate of success divided by the total number of cases in the sample.)

If we felt it unlikely that the results of our sample would arise due to chance alone, say 3 percent error, then

$$\begin{aligned} 3.0 &= 2.2 \sigma \\ 1.363 &= \sigma. \end{aligned}$$

Substituting in our original formula we would find

$$\begin{aligned} 1.363 &= \sqrt{\frac{90 \times 10}{N}} \\ 484 &= N. \end{aligned}$$

examination within 48 hours. Of those cases which reported back for their postpenicillin examination, 0.75 percent were found to have either a positive smear or a positive culture and were considered as treatment failures. These patients were immediately re-treated with another injection of 200,000 units of penicillin in oil and beeswax. No penicillin-resistant strain was encountered and all patients were cured after the second injection.

In the second sample, 82 percent of the patients reported back for postpenicillin examinations within 48 hours. In those re-examined, 1.45 percent still were positive either on smear or culture. These were re-treated with an injection of 200,000 units of penicillin in oil and beeswax. In this group, as well as the one mentioned above, none proved to be penicillin-resistant and the smear or culture of each was negative after the second injection of penicillin.

Using the higher failure rate found in sample 2, a standard deviation of 0.59 percent was obtained, based on the 410 reporting. Going back to the original assumption of a 3-percent error due to chance, it was found that the failure rate of the patients reporting for one or more posttreatment examinations would range between 0.16 percent to 2.76 percent. There are 3 chances in 100 that the true failure rate of the entire group of 33,733 cases would be above or below these figures. From these samples, it appears that the failure rate of the cases treated at the Municipal Social Hygiene Clinic could be less than 2.8 percent.

In comparing the two samples to determine whether or not the failure rate difference is due to sampling, it was found that there is no significant distinction between them.

### Incidental Observations During Sampling

In reviewing sample 2, other interesting observations were made. During the course of the examination for gonorrhea, a serologic test for syphilis also was made. It was found that 5.0 percent

showed a positive serology. The sampling showed that 40.3 percent reported back for the requested serologic test for syphilis after 1 month, and an additional 2.5 percent of the group returning for the test showed a positive serology. This may or may not be due to concomitant syphilis.

Based upon sample 2 we find a reinfection rate of 3.8 percent within 1 month's time shown by a positive smear or culture. In the second month after the first infection, an additional 3.2 percent of the group were found to be reinfected with gonorrhea. Besides the patients who returned during the first 2 months with one reinfection, there were 21.2 percent more who reported with a reinfection between the time of first infection and the time of the sampling study.

Observations were also noted on the number of reinfections occurring in this group. The percentages of reinfection shown in the records were as follows:

<i>Number of reinfections</i>	<i>Percentage of patients reinfected</i>
1-----	18.4
2-----	5.4
3-----	2.2
4 or more -----	2.2

(The largest number of reinfections in any one individual was recorded as 9.) All of those patients returning with reinfections were treated with 1 injection of 200,000 units of penicillin in oil and beeswax. No penicillin-resistant strain was encountered regardless of the number of reinfections in one individual.

It was noted that most of the patients who were reinfected had not come back for serologic follow-up. It was also found that the number of reinfections recorded per patient was significantly lower among females than among males.

### Summary and Conclusions

This report is based upon 33,738 cases from 1 clinic, serviced by 1 laboratory, during the period July 1, 1945, to December 31, 1946.

All cases received 1 injection of 200,000 units of commercial penicillin in oil and beeswax, intramuscularly.

A random stratified selection method was employed in order to determine the following statistical facts:

1. The combined samples showed 80.8 percent of the patients returned at least once for a physical and laboratory examination following penicillin therapy.

2. Maximum failure rate of 33,738 cases would not exceed 2.8 percent.

3. In one sample, 5 percent of the patients had a positive serologic test for syphilis on the first examination.

4. In neither the original nor the reinjected cases was a penicillin-resistant gonorrheal infection encountered.

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# Penicillin in Early Syphilis: A Statistical Comparison of Results From Two Studies<sup>1</sup>

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In November 1947, Arnold and his co-workers (1) at the Venereal Disease Research Laboratory, United States Marine Hospital, Staten Island, N. Y., published a report of their experience with penicillin in early syphilis. The results presented in the study aroused considerable interest because of their superiority to any previously reported by the Central Statistical Unit (2) for the clinics co-operating in a Nation-wide penicillin study, or by other investigators (table 1).

Consideration of the data<sup>2</sup> from the

Central Statistical Unit (CSU) and from the Venereal Disease Research Laboratory (VDRL) has made possible certain observations and comparisons that tend to clarify the apparent discrepancies between the results reported by the two groups.

## Definition of Terms

It is first to be noted that the VDR results are based upon cumulative re-treatment rates, whereas those of the CSU are in terms of cumulative failure rates. The two terms are not synonymous. The VDRL investigators reserve re-treatment for those patients who are observed to have either overt clinical relapse (or reinfection) or indubitable serologic relapse; the latter based upon the results of a battery of carefully controlled serologic tests, thus minimizing technical variations in any one procedure. The CSU has considered as failures not only these two groups of patients, but also those with "nonconforming" serologic re-

<sup>1</sup> From the Division of Research Grants and Fellowships, National Institutes of Health. Presented at the Symposium, "Recent Advances in the Study of the Venereal Diseases," held in Washington, D. C., April 8-9, 1948.

<sup>2</sup> The courtesy and cooperation of Dr. Margaret Merrell, Dr. Rowland Rider, and Miss Gwendolyn Futcher, of the Central Statistical Unit, and of Dr. John F. Mahoney, Director, Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island, N. Y., in providing access to the data are acknowledged by the author.



**Table 1.—Comparative results of penicillin treatment of early syphilis at the Central Statistical Unit and at the Venereal Disease Research Laboratory**

Schedule.....	Penicillin schedules <sup>1</sup>				
	Central Statistical Unit				Venereal Disease Research Laboratory
	A 4.8 q 2 hours for 8 days	B 4.8 q. 3 hours for 8 days	C 9.6 q. 3 hours for 15 days	A, B, and C combined	3.4 q. 2 hours for 7½ days
Number of clinics participating.....	3	9	9	16	1
Number of patients treated.....	143	134	290	567	728
Number of days after treatment		Cumulative failure rate			
0-28.....	0.00	0.00	0.00	0.00	0.00
29-56.....	1.14	0.12	1.02	0.59	0.00
57-84.....	3.88	1.23	3.13	2.25	0.41
85-112.....	7.18	2.76	6.07	4.62	1.06
113-140.....	10.84	4.03	8.60	7.34	1.52
141-168.....		8.82	10.81	8.98	2.00
169-196.....			12.11	12.67	2.00
197-224.....			12.48	13.19	2.29
225-252.....			14.07	14.28	2.29
253-280.....			14.53	15.42	2.66
281-308.....			15.19	15.42	3.08
309-336.....			15.27	16.08	3.55
337-364.....				16.43	3.55
365-456.....				18.08	4.75

<sup>1</sup> None of the schedules studied by the CSU is identical with the schedule reported by the VDRL. It has been necessary, therefore, to select and combine three CSU schedules which most nearly approximate that used by the VDRL.

lapses (based on the results of one serologic test rather than on a battery of tests) as well as patients who “fail” because of being seroresistant.

In order to determine the degree to which the differences in definition of terms and in serologic procedures may have influenced the outcome of the two studies, the most appropriate CSU schedules were reanalyzed on the basis of the VDRL criteria. It was possible in the reanalysis, among the CSU group of 567 patients, to exclude 19 from the total of 75 “failures.” Table 2 shows six representative cases which in the absence of further treatment could thus be reclassified.

A recomputation of the CSU data based on VDRL criteria substantially reduces the cumulative failure rate (table 3), but there still is a significantly higher percentage of failures than reported by the VDRL.

*Differences in Patient Population*

There are obvious differences in the patient populations treated at the VDRL and those treated by the CSU cooperating clinics. In table 4 is shown the distribution of sex, race, and stage of disease in the two groups. Especially noteworthy is the fact that the VDRL group of patients consists largely of white males with primary syphilis, whereas the largest single group of CSU patients is made up of Negro females with secondary syphilis.

It is difficult to demonstrate in the CSU material any statistically valid difference in therapeutic results between the sexes, the races, or between primary and secondary syphilis (table 5). There are, nevertheless, trends suggesting better results for whites, males, and patients in the primary stage of the disease. When white males with primary syphilis are compared

with Negro females with secondary syphilis (fig. 1), there is a difference that could occur by chance alone but once in 267 times ( $x/\sigma=2.90$ ).

There is, therefore, ample evidence that the therapeutic results of the VDRL investigators are influenced favorably by the type of patients they have treated; and conversely, the results of the CSU co-operating clinics are influenced unfavorably by the distribution of sex, race, and stage of disease among their patients.

**Table 2.—Representative cases originally classified as failures by the Central Statistical Unit reclassified as nonfailures**

CSU No.	Number of months after treatment												
	0	1	2	3	4	5	6	7	8	9	10	11	12
	STS <sup>1</sup> (Kahn units)												
110054.....	48	2	1	0	0	0	-----	8	° 16	0	0	-----	-----
349825.....	0	0	0	0	3	32	0	1	0	0	0	0	-----
090142.....	128	32	32	2	3	4	4	-----	-----	-----	-----	0	-----
340128.....	16	32	0	0	64	-----	-----	-----	-----	-----	-----	0	-----
010635.....	128	0	0	0	0	0	3	1	-----	-----	-----	-----	-----
029078.....	0	0	40	4	1	1	3	0	0	0	0	-----	-----

<sup>1</sup> Serologic test for syphilis.

**Table 3.—Recomputation of Central Statistical Unit data on basis of Venereal Disease Research Laboratory criteria**

Number of days after treatment	Total patients	Number of patients observed during this period or later	Failures			
			CSU criteria		VDRL criteria	
			Number	Cumulative percent	Number	Cumulative percent
0.....	36	---	---	---	---	---
0-28.....	19	531	0	0.00	0	0.00
29-56.....	32	512	3	0.59	3	0.59
57-84.....	30	480	8	2.25	8	2.25
85-112.....	27	450	11	4.62	8	3.99
113-140.....	24	423	12	7.34	10	6.26
141-168.....	25	399	7	8.98	5	7.42
169-196.....	30	374	15	12.67	11	10.15
197-224.....	18	344	2	13.19	0	10.15
225-252.....	21	326	4	14.28	3	10.98
253-280.....	24	305	4	15.42	4	12.15
281-308.....	24	281	0	15.42	0	12.15
309-336.....	16	257	2	16.08	1	12.49
337-364.....	37	241	1	16.43	1	12.85
365-456.....	123	204	4	18.08	0	12.85
457-548.....	37	81	1	---	1	---
549-639.....	17	44	0	---	0	---
640-730.....	15	27	1	---	1	---
731-912.....	12	12	0	---	0	---
Total.....	567	---	75	---	56	---

### Differences in Follow-up

#### Success in posttreatment observation.—

It has been presumed that patients who are lost from posttreatment observation are cured or fail to be cured at the same rate as those patients who remain under observation. There is some indirect evidence that this may not be true. CSU clinics whose follow-up is good have had quite uniformly higher failure rates than have those clinics whose follow-up is less satisfactory.

able 4.—Percentage distribution by sex, race, and stage of disease of patients in Central Statistical Unit and Venereal Disease Research Laboratory series

[All figures in percent]

Stage of syphilis	Male			Female			Total		
	White	Negro	Total	White	Negro	Total	White	Negro	Total
	Central Statistical Unit (566 patients)								
Primary-----	10.8	14.7	25.5	4.3	7.9	12.2	15.1	22.6	37.7
Secondary-----	7.4	14.3	21.7	10.0	30.6	40.6	17.4	44.9	62.3
Total-----	18.2	29.0	47.2	14.3	38.5	52.8	32.5	67.5	100.0
	Venereal Disease Research Laboratory (728 patients)								
	White	Negro	Total	White	Negro	Total	White	Negro	Total
Primary-----	53.7	11.4	65.1	1.2	0.3	1.5	54.9	11.7	66.7
Secondary-----	22.8	8.6	31.4	1.5	.5	2.0	24.3	9.1	33.3
Total-----	76.5	20.0	96.5	2.7	.8	3.5	79.2	20.8	100.0

Table 5.—Sex, race, and stage of disease as factors influencing failure rates after penicillin therapy

Number of days after treatment	Failures (cumulative percent)					
	Sex		Race		Stage of disease	
	Male	Female	White	Negro	Primary	Secondary
0-28-----	0.00	0.00	0.00	0.00	0.00	0.00
9-56-----	0.00	0.00	0.00	0.00	0.00	0.00
7-84-----	0.83	0.37	0.65	0.56	0.58	0.66
5-112-----	2.15	2.35	3.35	1.76	3.68	1.70
3-140-----	4.00	4.00	4.82	3.63	6.36	3.15
1-168-----	5.94	6.15	5.59	6.21	8.48	5.79
69-196-----	6.45	7.92	6.40	7.54	8.48	7.74
97-224-----	8.54	11.23	<sup>1</sup> 8.11	<sup>1</sup> 10.68	9.27	11.82
125-252-----	8.54	11.23	8.11	10.68	<sup>2</sup> 9.27	<sup>2</sup> 11.82
153-280-----	9.15	12.24	8.11	11.81	10.20	12.72
181-308-----	9.81	13.82	8.11	13.40	10.20	14.59
209-336-----	9.81	13.82	8.11	13.40	10.20	14.59
237-364-----	9.81	14.41	8.11	13.88	10.20	15.12
265-456-----	<sup>3</sup> 10.68	<sup>3</sup> 14.41	8.11	14.39	11.58	15.12
	10.68	14.41	8.11	14.39	11.58	15.12

<sup>1</sup>  $\chi/\sigma=0.83$ .

<sup>2</sup>  $\chi/\sigma=0.78$ .

<sup>3</sup>  $\chi/\sigma=1.08$ .

It is perhaps of some significance that the follow-up of patients treated at the Staten Island Marine Hospital necessarily is relatively poor, for the reason that most of the patients are merchant seamen and difficult to keep under observation. Approximately 30 percent of the patients are lost from observation as soon as they leave the hospital, and at the end of 1 year, only slightly more than one-third are still available for follow-up. By con-

trast, follow-up in the CSU clinics is, in general, considerably better.

*Frequency of posttreatment observations.*—There are in the material of the CSU some patients whose serologic course shows an early decrease in titer followed by an increase (serologic relapse) frequently not as high as the pretreatment level. It is possible that some of the VDRL patients with “unchanged or improved serologic status” have followed



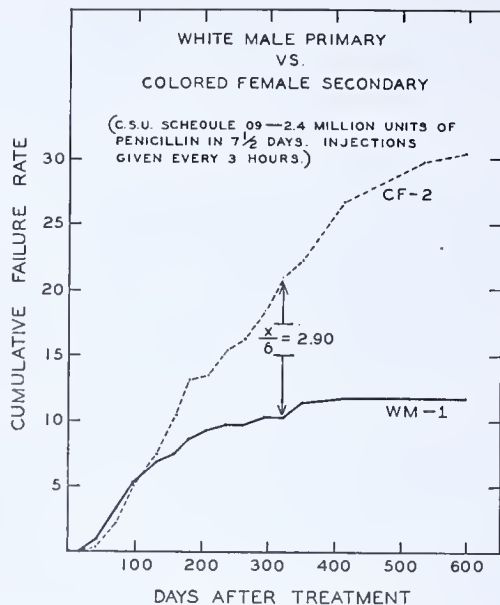


FIGURE 1.—Cumulative failure rates: White males with primary syphilis vs. Negro females with secondary syphilis (CSU data).

such a course and might have been classified as serologic relapses had more frequent observations been possible (fig. 2).

### Other Possible Factors

It has been suggested that merchant seamen may be less likely to be reinfected, especially by their original contacts. It also has been suggested that additional antisyphilitic therapy in some instances may be given to merchant seamen, since their travels bring them in contact with physicians who may not be cognizant of newer methods of syphilis therapy and serologic interpretation.

Arnold and his co-workers imply a special virtue in the administration of penicillin every 2 hours. Schoch (3) also has found the 2-hour interval to be more satisfactory than schedules involving injections every 3 hours. On the other

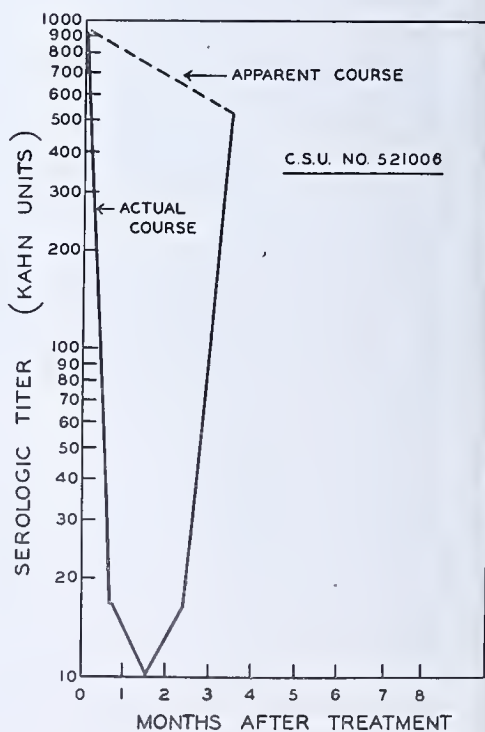
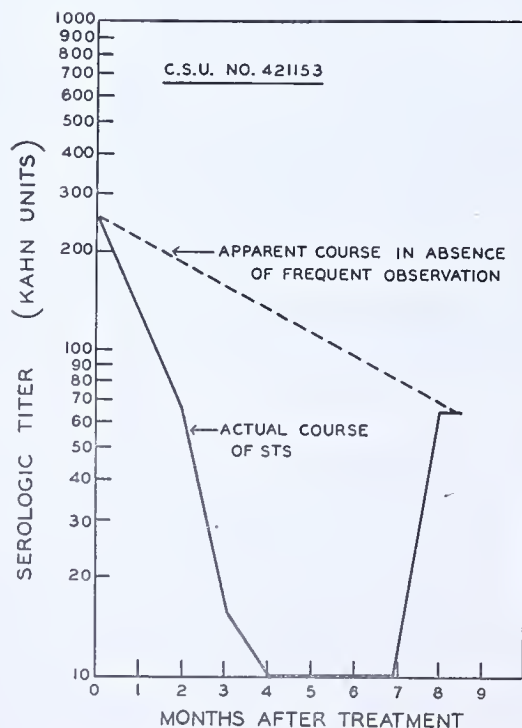


FIGURE 2.—Infrequent posttreatment observations as a possible source of error in interpretation of serologic course following antisyphilitic therapy.

band, Thomas (4) has observed no significant difference between 2- and 3-hour injection intervals. Moreover, the experimental work of Eagle, Magnuson, and Fleischman (5) and the clinical data of the CSU suggest no advantage in shortening the time interval between injections. Whether there is any inherent virtue in the 2-hour schedule can be neither affirmed nor categorically denied from the evidence here adduced. What part, if any, these and perhaps other factors play is pure conjecture.

### Summary

1. A statistical comparison has been made to determine the causes for the discrepancies between the results of the Venereal Disease Research Laboratory and those of the Central Statistical Unit in the penicillin treatment of early syphilis.
2. The factors which appear to be of greatest significance are: differences in

definition of terms and in serologic techniques, differences in the sex, race, and stage of disease distributions of the two groups of patients, and differences in the success and frequency of follow-up.

3. All of these differences tend to favor low failure rates in the VDRL series, and to emphasize the incidence of failures in the clinics reporting to the Central Statistical Unit.

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## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of articles concerned with venereal diseases or related subjects which have been published in the better known journals during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

#### ACTA DERMAT.-VENEREOL., STOCKHOLM

Blood histamine and arsphenamine dermatitis. Åke Nilzén. 27: 521-527, No. 6 1947.

#### REVUE DE DERMATOLOGIE ET DE VÉNÉRÉOLOGIE

[Meetings of The Norwegian Dermatological Society, 1946.] 27: 528-534, No. 6, 1947.

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A new quick method for staining *Treponema pallidum*. H. A. Cohen. 6: 99-100, Mar. 1947. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 3: 175, Mar. 1948.]

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The diagnosis and treatment of diseases of the anorectum. Harry E. Bacon, James P. Fleming, Caleb H. Smith, Lola L. Pedlow, M. Browne Holeman and Robert J. Rowe. Review. 1: 257-267, Sept. 1946.

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The current status of calcium penicillin in beeswax and peanut oil. Data from a study of 600 cases and clinical observation of 4,000 patients given 60,000 injections. Monroe J. Romansky. Seminar on Antibiotics. 1: 395-411, Oct. 1946. \*

Penicillin in the treatment of syphilis. Frank W. Reynolds. Seminar on Antibiotics. 1: 661-674, Dec. 1946.

Penicillin and glutamic acid. Editorial. 4: 627-628, May 1948.

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Serum proteins in syphilis. Electrophoretic study. Earl P. Benditt and Sheldon A. Walker. Clinical Studies. 4: 663-670, May 1948.

# AM. J. SYPH., GONOR. & VEN. DIS., ST. LOUIS

Gonorrhea control during the decade of World War II. Eugene A. Gillis. 32: 99-105, Mar. 1948.

Gonorrhea in the United States Navy during World War II. George W. Mast. 32: 106-114, Mar. 1948.

\*Gonorrhea in World War II. Louis N. Altshuler. 32: 115-123, Mar. 1948.

\*The treatment of gonococcal infection with micronized penicillin by inhalation. George V. Taplin and Howard T. Thompson. 32: 124-132, Mar. 1948.

\*Ambulatory treatment of gonorrhea with penicillin preparations. Experiences with various preparations and techniques. Adolph Jacoby, Arthur Ollswang, Jules Freund and Theodore Rosenthal. 32: 133-138, Mar. 1948.

A comparison of twenty-four-hour and forty-eight-hour readings of routine gonococcus cultures. Adelaide M. Mueller and E. Ellen Nell. 32: 139-140, Mar. 1948.

Bacteriologic follow-up of penicillin-treated gonorrhea in women. Nell Hirschberg. 32: 141-144, Mar. 1948.

\*Cultural and serologic studies on granuloma inguinale. Wolcott Dunham and Geoffrey Rake. 32: 145-149, Mar. 1948.

The antigenic relationships of *Donovania granulomatis* (Anderson) and the significance of this organism in granuloma inguinale. Geoffrey Rake. 32: 150-158, Mar. 1948.

\*The treatment of granuloma inguinale with streptomycin. Harold L. Hirsh and S. Ross Taggart. 32: 159-164, Mar. 1948.

Fundamental problems for laboratory research on *Neisseria gonorrhoeae* and gonococcal infection. Justina H. Hill. Special Article. 32: 165-189, Mar. 1948.

**Gonorrhea in World War II.** Louis N. Altshuler. Am. J. Syph., Gonor. & Ven. Dis., 32: 115-123, 1948.

In a discussion of gonorrhea treatment before and during World War II, the author points out that whereas the venereal diseases constituted one of the leading causes of noneffectiveness immediately prior to our entry into the war, these diseases had become of only minor importance toward the end of the war, an achievement due to improvement in treatment methods since it occurred in the face of a rising venereal disease rate.

Treatment of gonorrhea by the sulfonamides and other therapy prior to the war commonly brought failure, with serious complications and prolonged invalidism. Sulfanilamide, presented in 1937 as the first drug to have specific chemotherapeutic action against the gonococcus, was later replaced by more desirable sulfonamides, particularly sulfathiazole, with a lower incidence of toxic reactions. In 1941, the treatment of gonorrhea with sulfathiazole was standardized in the Army, the recommended treatment consisting of 1.0 gm. four times daily for 5 days. With this therapy, a cure rate of approximately 75 percent was achieved, noneffectiveness declined, and the percentage of complications dropped considerably. In 1943, patients who failed to respond to the initial course of 20 gm. of sulfathiazole were given an increased course of 33 gm., and the failures to this course were subjected to fever therapy. The numbers of sulfonamide-resistant individuals for whom no therapy appeared successful increased enormously, however.

Penicillin, when introduced, was tried in various dosages until in 1945 it was becoming clear that although approximately 10 to 15 percent of patients failed to respond to 100,000 units, the majority of patients eventually responded to repeated courses or increased dosages. Penicillin in adequate dosage had therefore solved the problem of sulfonamide-resistant gonorrhea, provided a substitute for dangerous fever therapy, and relieved general hospitals of the rapidly in-



creasing number of gonorrhea patients. During the last 2 years of World War II, gonorrhea had consequently become a relatively minor infection producing a small ineffective rate with few complications. In 1937, for instance, complications developed in 28 percent of gonorrhea cases, whereas in 1944 complications amounted to a fraction of 1 percent of all cases.

The value of penicillin in making possible the treatment of patients while in duty status, criteria of cure, and serologic follow-up of gonorrhea patients for evidence of syphilis are also discussed in detail by the author.

**The treatment of gonococcal infection with micronized penicillin by inhalation.** George V. Taplin and Howard T. Thompson. *Am. J. Syph., Gonor. & Ven. Dis.*, 2: 124-132, 1948.

The authors present a method of inhalation of micronized penicillin-glucose or glucose-plasma mixtures which eliminates injections, reduces the cost of penicillin, and can be self-administered. Two types of inhalation apparatus are described.

Twenty-five patients with acute gonorrhea have been treated with this method. Prior to therapy, a Gram stain was made of the urethral discharge and a culture on chocolate agar was inoculated. Clinical cure was verified by repeated cultures in all cases, and smears were made in patients showing persistent urethral discharge. Criteria for cure consisted of apparent clinical cure and at least two negative smears and cultures within the first week after treatment. The initial ambulatory patients in this study were treated with inhalations of 50,000 units every 3 hours, while the remaining ambulatory patients received one inhalation of 150,000 to 300,000 units of penicillin-glucose or penicillin-plasma mixtures. Three patients were hospitalized.

Inhalations of micronized penicillin gave high, sustained blood and urine concentrations. The results showed that: (1) 18 patients were cured, clinically and bacteriologically, with 1 treatment; (2) 3 patients were cured clinically, but bac-

teriologic follow-up in these individuals beyond the first 48- or 72-hour determinations was not obtained; and (3) 4 patients were mechanical failures because of inability to use the apparatus properly. Re-treatment in these 4 cases resulted in 3 cures and 1 true failure, this patient failing on an initial dose of 200,000 units and on re-treatment with 2 doses of 200,000 units at 12-hour intervals.

The authors feel that this method, which gives therapeutic blood and urine penicillin concentrations for 24 hours or more, may be expected to cure all but the most resistant cases of gonorrhea, if properly administered.

**Ambulatory treatment of gonorrhea with penicillin preparations. Experiences with various preparations and techniques.** Adolph Jacoby, Arthur Ollswang, Jules Freund and Theodore Rosenthal. *Am. J. Syph., Gonor. & Ven. Dis.*, 32: 133-138, 1948.

The various methods of ambulatory treatment of gonorrhea are considered, beginning with the first practical ambulatory method introduced in August 1944 in New York City, using an aqueous solution of penicillin administered by intramuscular injection every 2 hours for three injections. However, dissatisfaction with multiple injections for ambulatory treatment brought about the use of the single-injection method using a water-in-oil emulsion, oily mixtures, and later, oral penicillin. Some of the methods used and their results are described as follows:

1. *Penicillin in water.*—One hundred and seventeen patients received 150,000 units of penicillin dissolved in 2 cc. of water injected intramuscularly in a single dose. Of 101 men and 16 women who were adequately followed, 71 percent of the men and 75 percent of the women were cured.

2. *Penicillin emulsion.*—Of 2,467 patients treated with 200,000 units of penicillin in a water-in-oil emulsion, 80 percent of the 1,326 men and 87 percent of the 484 women adequately followed were cured.

3. *Penicillin-oil mixtures*.—One of the preparations used consisted of a mixture of peanut oil and falba using crystalline potassium penicillin G. Sixty-seven patients (57 men and 10 women) were treated with a single intramuscular injection of 150,000 units. Eighty-seven percent of the men and 80 percent of the women were cured.

4. *Oral penicillin*.—Tablets of crystalline potassium penicillin H buffered with glycerides and sodium salts of fatty acids were used. Eighty-six men and ten women were followed; cure was observed in 76 percent of the men and 70 percent of the women.

Treatment failures were determined by smears and cultures taken 1 week after treatment.

Blood level determinations showed that, on the average, neither oral preparations, except in large single doses, nor single doses of aqueous penicillin, gave appreciable blood levels in 3 hours. The oil-falba mixtures and the stearic acid preparations showed therapeutic amounts of penicillin in the blood up to 11 hours. Peanut oil-beeswax preparations showed appreciable blood levels up to 24 hours, but it is noted that none of the preparations used produced therapeutic blood levels beyond 11 hours.

In summary, of 15,020 patients treated with different forms of penicillin, 10,407 of whom were followed long enough for conclusive evaluation, ambulatory treatment by injection of three divided doses of an aqueous solution of penicillin, by a single injection of penicillin in an absorption retarding oily mixture, or by oral administration of buffered penicillin tablets yielded cure rates between 78 percent and 94 percent. The best practical method of treatment, however, was found to be a single intramuscular injection of an oily mixture of 300,000 units of penicillin.

**Cultural and serologic studies on granuloma inguinale.** Wolcott Dunham and Geoffrey Rake. *Am. J. Syph., Gonor. & Ven. Dis.*, 32: 145-149, 1948.

The present study was undertaken to

determine whether the organism *Dorvandia granulomatis* could be grown on artificial medium devoid of yolk or other antigenic substance; at the same time more thorough evaluation of the complement-fixation test as a diagnostic procedure was also attempted. Details of the technic, which was similar to that used by McKee, Rake, and Shaffer for complement-fixation studies on lymphogranuloma venereum, are described by the authors.

Results of the complement-fixation test with an antigen prepared from *D. granulomatis* cultivated on an artificial medium are presented in table form. It was seen that: (1) of 58 serums from patients diagnosed as having granuloma inguinale 50 (86 percent) gave positive complement-fixation reactions; (2) 32 serums from syphilitic patients yielded positive results in only 1 case; (3) 18 serums from cases of acute gonorrhea yielded two positive reactions; (4) in serums from 71 patients with lymphogranuloma venereum two positive reactions were obtained; (5) in 10 cases of chancroid, 3 serums were positive; and (6) 4 serums from normal individuals all gave negative reactions. It is noted that serums from cases of granuloma inguinale gave fixation titers higher than those seen in the other diagnosed diseases.

The fact that lymphogranuloma venereum and chancroid, the two diseases most apt to be confused with granuloma inguinale, gave approximately 30 percent positive reactions may have been due to mixed infections with granuloma inguinale, and the fact that 21 percent of the serums from cases of chronic ulceration due to circulatory disturbances gave positive reactions suggests that certain chronic ulcers became infected with the organism with an antigenic component similar to that present in the tests used in this study. It is noted, however, that the percentage of granuloma inguinale serums giving positive reactions and their reaction titer were significantly higher than the percentage of any of the false positive tests.

The authors show that *D. granulomatis*

he presumed causative agent of granuloma inguinale, can be cultivated on an artificial medium and that specific fixation reactions apparently occur in 12 percent of individuals exposed to venereal disease and in 21 percent of individuals with chronic nonspecific ulcers.

**The treatment of granuloma inguinale with streptomycin.** Harold L. Hirsh and S. Ross Taggart. *Am. J. Syph., Gonorr. & Ven. Dis.*, 32: 159-164, 1948.

The authors report on the treatment with streptomycin of 21 unselected Negro patients with granuloma inguinale, ranging in age from 19 to 48 years. Fourteen of the patients had had evidence of the disease for 1 to 8 months; 7 had had lesions for 14 months to 12 years.

Streptomycin therapy was instituted immediately following the diagnosis, which was established by demonstration of Donovan bodies with Wright's stain of smears from the involved tissue and confirmed by histologic study of biopsy material from the lesions. All patients received 1 gm. of streptomycin per day intramuscularly in divided doses every 4 hours, total dosages ranging from 5 to 47 gm.

In all patients there was complete healing of ulcerations before discontinuance of therapy, except in one individual with carcinoma at the site of the granulomatous lesion. Characteristic changes as a result of therapy in extensive lesions included: (1) disappearance of pain within 24 to 48 hours; (2) reduction of redness and evidence of healing within a few days; and (3) decrease in size after a week, with continued decrease following discontinuation of therapy. Since the time necessary for complete healing was in direct proportion to the extent of the disease, treatment was not stopped until the lesions were covered with skin, which was invariably depigmented.

Biopsies taken at weekly intervals showed Donovan bodies at the end of 1 week of therapy. None was found in the 2-week specimens, however. One patient exhibited toxic reactions to streptomycin,

including headache, dizziness, and tinnitus 1 week after institution of therapy, but these symptoms disappeared spontaneously within a few days, with no interruption of therapy. Patients followed for periods up to 14 weeks have shown no recurrence, relapse, or appearance of new lesions, it is stated.

Streptomycin, which in this study produced complete healing of the most extensive ulceration, diminution in size of the granulomatous masses, and disappearance of the Donovan bodies, is claimed by the authors to be the drug of choice in the treatment of granuloma inguinale.

An addendum to this article states that similar favorable results have been observed in the follow-up, for periods up to 10 months, of the patients in this study and in an additional group of 25 patients treated with a single daily injection of 1 gm. of streptomycin.

#### ANAT. REC., PHILADELPHIA

Anatomical studies on jet penetration of human skin for subcutaneous medication without the use of needles. Frank H. J. Figge and Robert P. Scherer. 97: 335, Mar. 1947. [Abstracted in *Quart. Rev. Dermat. & Syph.*, Washington, 2: 519-520, Dec. 1947.]

#### ARCH. INT. MED., CHICAGO

Syphilis. A review of the recent literature. Charles F. Mohr, Virgil Scott, Richard D. Hahn and Joseph Earle Moore. *Progress in Internal Medicine*. 77: 332-364, Mar. 1946; 428-472, Apr. 1946.

Gonococcal peritonitis of the upper part of the abdomen in young women. (Phrenic reaction, or subcostal syndrome of Stajano; Fitz-Hugh-Curtis syndrome.) Report of cases of three patients treated successfully with penicillin and a summary of the literature. Malcolm M. Stanley. 78: 1-13, July 1946.

Treatment of gummatous hepatic syphilis with penicillin. Report of two cases. Harold A. Tucker and David D. Dexter. 78: 313-322, Sept. 1946.

Syphilis. A review of the recent literature. Frank W. Reynolds and Joseph Earle Moore. *Progress in Internal Medicine*. 78: 592-625, Nov. 1946; 78: 733-769, Dec. 1946; 79: 92-112, Jan. 1947.

Clinical nephropathies in early syphilis. Evan W. Thomas and Max Schur. 78: 679-686, Dec. 1946.



Penicillin in the treatment of keratosis blenorrhagica with polyarthrits. A. W. Freireich, Sheldon Schwartz and Otto Steinbrocker. 79: 239-250, Feb. 1947.

#### BETTER HEALTH, RALEIGH

Are doctors playing fair about their VD cases? M. B. Bethel. Personally Speaking. 2: 16, 24, Feb. 1948.

#### BRIT. J. PHARMACOL., LONDON

The possibility of toxic effects from 2,3-dimercaptopropanol in conditions of impaired renal or hepatic function. G. R. Cameron, F. Burgess and V. S. Trenwith. 2: 59, 1947. [Abstracted in Am. J. Syph., Gonorr. & Ven. Dis., St. Louis, 32: 195, Mar. 1948.]

#### BRIT. M. J., LONDON

A fatal case of malignant syphilis. Robert Lees and William Fowler. Medical Memoranda. No. 4548: 451, Mar. 6, 1948.

Penicillin and gonorrhea. An analysis of 150 cases treated by the single-injection method. C. C. R. Downing. No. 4551: 599-601, Mar. 27, 1948.

Transmission of syphilis. A. O. F. Ross. Medical Memoranda. No. 4553: 691, Apr. 10, 1948.

#### CALIFORNIA MED., SAN FRANCISCO

Granuloma inguinale. David Frost and Bernard F. Ryan. 68: 77-78, Feb. 1948.

#### CALIFORNIA'S HEALTH, SACRAMENTO

Department issues statement on use of silver nitrate. 5: 346, Apr. 15, 1948.

Epidemiologic investigations of V. D. cases. 5: 354-355, Apr. 30, 1948.

#### CANAD. J. PUB. HEALTH, TORONTO

Penicillin in oil and wax in the treatment of gonorrhea in women. Frieda Fraser and Lillian Lome. 38: 484-490, Oct. 1947.

#### CANCER RESEARCH, BALTIMORE

Etiologic factors in carcinoma of the penis. Robert Schrek and Herman Lenowitz. 7: 180-187, Mar. 1947. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 2: 461, Dec. 1947.]

#### CINCINNATI J. MED., CINCINNATI

\*Antibiotics in the treatment of venereal diseases. Joseph Earle Moore. 29: 263-270, May 1948.

**Antibiotics in the treatment of venereal diseases.** Joseph Earle Moore. Cincinnati J. Med., 29: 263-270, 1948.

In an extensive review of developments in the therapy of venereal disease, the author considers the value of various antibiotics in the following infections:

1. *Gonorrhea*.—In acute or chronic gon-

ococcal infections, a cure rate of 92 to 98 percent can be attained by any method which yields a measurable blood penicillin level for 6 to 8 hours. The most widely employed schedule for gonorrhea at the present time is a single intramuscular injection of 300,000 units of penicillin in peanut oil-beeswax, although the new relatively insoluble salts of penicillin such as procaine or aluminum penicillin are also expected to prove useful as they become available. To date, genuine penicillin-resistant gonorrhea has not been seen in studies made for the Army, the United States Public Health Service, and the Johns Hopkins Venereal Disease Research Center. Chinn and his group report that streptomycin has yielded a 90 percent cure rate with a single intramuscular injection of 0.2 gm. in aqueous solution and a 100-percent cure rate with a single dose of 0.3 gm. Other antibiotic agents, such as tyrocidine, and perhaps fumigacin and proactinomycin, have an in vitro effect against the gonococcus but have not been studied clinically.

2. *Granuloma inguinale*.—Although penicillin is of little or no value in this disease, streptomycin is highly effective. In 90 patients treated with doses of streptomycin averaging 21 gm., healing of the lesions was rapid, Donovan bodies disappeared in about 6 days, and no serious toxic reactions were observed. Chloromycetin apparently has not been tried clinically or experimentally, it is stated.

3. *Lymphogranuloma venereum*.—Neither penicillin nor any other antibiotic has proved of definite value in this virus infection.

4. *Chancroid*.—Sulfonamides are the agents of choice in this disease, as against streptomycin, which has some curative value, and penicillin, which is ineffective in human chancroid. Tyrothricin is moderately effective in vitro but has not been clinically employed.

5. *Syphilis*.—Studies indicate that crystalline penicillin G is the preparation most desirable in syphilotherapy. In animals, the effect of penicillin is enhanced by the simultaneous administration of arsenic and bismuth, the penicillin being

most effective when administered during fever rather than at normal body temperature. Failure rates in early syphilis with various treatment schedules employing amorphous and crystalline penicillin G are shown in table form. For instance, as against a 20-percent failure rate at the end of 1 year, using amorphous penicillin schedules, only a 10-percent rate results from the use of 4.8 million units of crystalline penicillin G in aqueous solution over an 8-day period.

Penicillin appears to be clinically superior to metal chemotherapy in all types of neurosyphilis, the clinical improvement depending upon the extent to which symptoms are due to inflammation rather than to degeneration. While penicillin alone is satisfactory in the relatively benign forms of neurosyphilis, such as acute syphilitic meningitis, a combination of penicillin and malaria therapy simultaneously administered may be superior to penicillin alone in the more serious parenchymatous forms, such as paresis and tabes dorsalis. Streptomycin, however, is almost completely ineffective in experimental syphilis, and bacitracin has produced a relapse rate of 50 percent, in addition to high degrees of renal irritation, in human syphilis.

6. *Yaws*.—In a Haitian study, a 1- to 2-day course of penicillin of 1.2 million units of penicillin in oil-beeswax effectively healed lesions and produced serologic response somewhat less prompt and uniform than in early syphilis. Especially important from a public health standpoint would be the development of a successful 1-day treatment schedule for use in tropical countries where large numbers of patients must be treated on an ambulatory basis in rural clinics.

#### DERMATOLOGICA, BASEL

Elephantiasis of the penis and scrotum and lymphogranuloma venereum infection. Waldemar E. Coutts. 93: 337-350, 1946. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 3: 201, Mar. 1948.]

#### EAST AFRICAN M. J., NAIROBI

Penicillin treatment of acute gonorrhea and its complications, and early syphilis [in Africans] as practised in the East Africa Command. G. C. Cochrane. 23: 285-286, Sept. 1946.

The treatment of early syphilis [in Africans] with penicillin sodium. G. C. Cochrane. 23: 287-288, Sept. 1946.

#### HARPER HOSP. BULL., DETROIT

X-ray in the diagnosis of abdominal aortic aneurysm. E. F. Lang. 5: 21, 1947. [Abstracted in Am. J. Syph., Gonorr. & Ven. Dis., St. Louis, 32: 193, Mar. 1948.]

#### HEALTH NEWS SUPPLEMENT, ALBANY

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#### ILLINOIS HEALTH MESSENGER, SPRINGFIELD

Favorable health record in 1947. 20: 6, Jan. 15, 1948.

#### INDIAN J. M. RESEARCH, CALCUTTA

Plasma proteins in health and disease. Part II. Fractionation of plasma proteins in hyperproteinaemia. N. C. Datta. 35: 295-322, Oct. 1947.

#### INDIAN M. GAZ., CALCUTTA

Drugs in syphilis. Notes on some remedies. R. N. Chaudhuri. Therapeutic Notes. 82: 672-674, Nov. 1947.

#### INDUST. MED., CHICAGO

Serological tests for industrial workers. Walter Clarke. 16: 567-569, Dec. 1947.

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Enhancement of penicillin effectiveness by traces of cobalt. Louis A. Strait, Jean Dufrenoy and Robertson Pratt. 37: 133-135, Apr. 1948.

The assay of bacitracin. Grant D. Darker, Helen B. Brown, Alfred H. Free, Barbara Biro and John T. Goorley. 37: 156-160, Apr. 1948.

#### J. BACT., BALTIMORE

Cultural characteristics of *Donovania granulomatis*. Geoffrey Rake and John J. Oskay. 55: 667-675, May 1948.

Cytochemical mechanisms of penicillin action. VI. The influence of cobalt on the optimal bacteriostatic concentration of penicillin. Robertson Pratt and Jean Dufrenoy. 55: 727-738, May 1948.

A further note on the antigenic relationships of *Donovania granulomatis* (Anderson). Geoffrey Rake. 55: 865-867, June 1948.

#### J. BIOL. CHEM., BALTIMORE

A chemical method for the determination of streptomycin in blood and spinal fluid. George E. Boxer and Viola C. Jelinck. 170: 491-500, Oct. 1947.

#### J. INFECT. DIS., CHICAGO

The evaluation of antibiotics by the prevention of experimental syphilis. Geoffrey Rake, Wolecott B. Dunham and Richard Donovick. 81: 122-129, Sept.-Oct. 1947.

Studies on lymphogranuloma venereum. V. The action of some antibiotic substances and sulfonamides in vitro and in vivo upon

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- J. INVEST. DERMAT., BALTIMORE**  
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 Skin sensitization to BAL. Theodore Carnbleet. 9: 281-282, Dec. 1947.
- J. M. A. ALABAMA, MONTGOMERY**  
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- J. DE MÉD. DE BORDEAUX, BORDEAUX**  
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- J. MICHIGAN M. SOC., ST. PAUL**  
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- J. MISSOURI M. A., ST. LOUIS**  
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- J. ROY. ARMY M. CORPS, LONDON**  
 The white cell count in early syphilis of males. R. R. Willcox. 90: 61-64, Feb. 1948.  
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- J. ROY. INST. PUB. HEALTH & HYG., LONDON**  
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- J. ROY. NAV. M. SERV., LONDON**  
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 Treatment of syphilis, with special reference to penicillin. Paul A. O'Leary. 48: 96-99, Mar. 1948.
- LANCET, LONDON**  
 Venereal disease control at home and abroad. Annotations. 2: 63, July 12, 1947.  
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- LES PRIX NOBEL EN 1946, STOCKHOLM**  
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- M. ANN. DISTRICT OF COLUMBIA, WASHINGTON**  
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- M. BULL. STANDARD OIL CO. OF NEW JERSEY**  
 Syphilis. Recommendations for the routine handling of cases. Outline of treatment and follow-up, 1947 revision. Editorial. 8: 7-26, Apr. 1948.  
 Some modifications in the classification of venereal diseases. K. Vigors Earle. 8: 64-66, Apr. 1948.
- M. CLIN. NORTH AMERICA, PHILADELPHIA**  
 \*Neurosyphilis and the latest methods of treatment. Bernhard Dattner. 32: 707-719, May 1948.

### Neurosyphilis and the latest methods of treatment. Bernhard Dattner. M. Clin. North America, Philadelphia, 32: 707-719, May 1948.

The author discusses spinal fluid tests as indispensable in recognizing syphilitic involvement of the central nervous system and in evaluating the therapeutic efficacy of penicillin. Four spinal fluid tests which are obligatory in cases of suspected neurosyphilis include the following:

1. *Complement-fixation test.*—This affords a superior means of determining the amount of reagin in spinal fluid, the presence of which indicates a past or present syphilitic infection of the central nervous system. However, since the activity of the process is not revealed by the complement fixation test, a cell count is necessary to disclose the status of the infection.

2. *Cell count.*—The first sign of a syphilitic invasion of the central nervous system is an increased cell count; an active inflammatory process due to syphilis is rarely present with a normal number of cells in the spinal fluid. Rapid reversal of the abnormally high cell count to normal values following adequate treatment



1: neurosyphilis makes a reliable cell count of paramount importance.

3. *Total protein estimation.*—Patients whose syphilitic disease in the central nervous system has been definitely checked by therapy exhibit a gradual decrease in protein, whereas patients who relapse after treatment present increasing amounts of total protein on repeated tests.

4. *Colloidal gold test.*—The complement fixation test, cell count, and total protein estimation give information only of the specificity, intensity, and activity of the syphilitic process, so that in order to ascertain whether the infection involves primarily the interstitial tissues or the parenchyma proper of the central nervous system, it is necessary to employ a colloidal test, such as Lange's colloidal gold test. The gamma globulins, which act as a precipitating agent in the colloidal tests, appear in the spinal fluid when parenchymatous structures of the central nervous system are being destroyed, thus yielding the paretic curves (first zone).

Although each one of these four tests represents a totally different and independent approach to the study of the pathologic process in the central nervous system, the results taken together form a syndrome whose interpretation affords reasonably accurate information about the syphilitic process in the central nervous system.

In discussing results of treatment as revealed by spinal fluid testing, the results of penicillin treatment at Bellevue Hospital are described. Approximately 300 patients with neurosyphilis were treated by intramuscular injections of penicillin alone in total dosages varying from 2 to 9 million units over periods of 9 to 28 days, follow-up observation covering 6 to 36 months. It was seen that of 151 patients with various forms of neurosyphilis, 135 (90 percent) attained satisfactory status, i. e., arrest of the syphilitic process as indicated by the spinal fluid syndrome; 12 patients (7 percent) attained indefinite status, in which the cell count showed borderline

values and the protein content remained high; and 4 (3 percent) were failures, the spinal fluid findings remaining unchanged or becoming worse. The largest percentage of failures occurred in the patients with asymptomatic and meningovascular syphilis, who received smaller amounts of penicillin than those with general paresis. Since re-treatment with larger amounts of penicillin produced satisfactory results in most cases, it is believed that an intensification and prolongation of penicillin therapy would improve the over-all results, which, it is pointed out, were similar to or perhaps better than those previously observed following malaria therapy. <sup>4</sup>

#### M. OFFICER, LONDON

The conquest of ophthalmia neonatorum. 79 : 161, Apr. 17, 1948.

Venereal disease course for nurses. 79 : 169, Apr. 17, 1948.

#### MIL. SURGEON, WASHINGTON

Penicillin and streptomycin precursors. [Their probable source and derivation.] R. de Rohan Barondes. 102 : 50-55, Jan. 1948.

\*A bacteriological comparison of penicillin and silver nitrate for prophylaxis against ophthalmia neonatorum. H. Charles Franklin. 102 : 179-185, Mar. 1948.

**A bacteriological comparison of penicillin and silver nitrate for prophylaxis against ophthalmia neonatorum.** H. Charles Franklin. Mil. Surgeon, 102 : 179-185, 1948.

This article reports bacteriologic findings in a study of ocular abnormalities following either penicillin or silver nitrate prophylaxis in the eyes of 1,710 infants during a 7-month test. Penicillin was used for 4 months and silver nitrate for 3 months. Prophylaxis was performed in the delivery room within 1 hour after birth, before the infants were moved to the nursery. Prophylaxis with penicillin was also carried out in the nursery.

The ocular area was wiped with cotton, and 2 or 3 cc. of sterile saline or sterile distilled water, depending on the diluent used, were used to flush the eyes. When penicillin was employed, 1 drop of a solu-

tion containing 2,500 units of the crystalline sodium salt per cubic centimeter of diluent was instilled into the conjunctival sac of each eye. Saline solution was used as the diluent two-thirds of the time and sterile distilled water the remainder. A fresh solution was used; it was kept no longer than a week, at 59° F. when not in use. In the nursery, 1 drop was placed in each eye daily for 3 days following birth. Silver nitrate was used as a 1-percent solution in distilled water, prepared daily, and was dispensed from a new dropper bottle. One drop was used in each eye. No prophylaxis with silver nitrate was carried out in the nursery.

Cultures were taken in the hospital of those infants whose eyes contained pus, and, whenever possible, the same procedure was carried out at home, during the first 2 weeks of life. Also, 100 cultures, 50 representing each method of prophylaxis, were taken of the eyes of those infants manifesting other eye abnormalities, such as eyelid watering, conjunctival redness, or a watery discharge, on the first or second day of life. A separate sterile swab was used for each eye, and both swabs were placed in a sterile specimen tube containing 2 cc. of tryptose broth (for cultures taken in the hospital) or sterile saline (for cultures taken in the home). Routine cultures were made on plates containing blood agar and eosin methylene-blue agar, and in tubes of blood tryptose broth. McLeod's medium was employed for isolation of *Neisseria gonorrhoeae*. Further details of the bacteriologic procedure are set forth in the article.

Twenty infants (2.1 percent) of 961 infants receiving penicillin prophylaxis exhibited pus while in the nursery. In 16 (80.0 percent) of the 20 infants, cultures were positive for strains of one or more of the following organisms: *Staphylococcus aureus*, *Staphylococcus albus*, *Pseudomonas pyocyaneus*, *Streptococcus*, *Bacterium prodigiosus*, and *Escherichia coli*. Of 749 infants receiving silver nitrate prophylaxis, 45 (6.0 percent) showed pus in their eyes while in the nursery; 17 (37.8 percent) of these

were positive for strains of one or more of the following organisms: *S. aureus*, *S. albus*, gram-positive sporulating bacillus, gram-negative sporulating bacillus, *Corynebacterium hofmannii*, unclassified diphtheroid, and *Streptococcus*.

Among the 50 infants who had had penicillin prophylaxis and showed eye abnormalities other than pus, 26 (52.0 percent) gave cultures positive for strains of one or more of the following organisms: *S. aureus*, *S. albus*, *Staphylococcus citreus*, *E. coli*, unclassified diphtheroid, *Bacterium aerogenes*, gram-negative sporulating bacillus, and a member of the *Actinomyces* group. The group of 50 infants with similar abnormalities but who had received silver nitrate prophylaxis also had 26 (52.0 percent) of the cultures positive for strains of one or more of the following organisms: *S. aureus*, *S. albus*, *E. coli*, *Streptococcus*, and *Bacterium fecalis alcaligenes*.

After penicillin prophylaxis, 22 (3.1 percent) of the 717 infants seen at home exhibited pus during the first 2 weeks of life. Cultures were taken of 15 of these with 14 (93.3 percent) positive for strains of one or more of the following: *S. aureus*, *S. albus*, *S. citreus*, *Streptococcus*, *C. hofmannii*, *Bact. aerogenes*, unclassified diphtheroid, and *P. pyocyaneus*. Following silver nitrate prophylaxis, 12 (2.4 percent) of 470 infants seen at home had pus in their eyes during the first 2 weeks of life. Cultures were made of 10 of these. All were positive for strains of one or more of the following: *S. aureus*, *S. albus*, *Streptococcus*, *C. hofmannii*, unclassified diphtheroid, *Bact. fecalis alcaligenes*, *E. coli*, and gram-positive sporulating bacillus.

Of the 142 organisms isolated in the 190 cultures made, there were no obligate anaerobes, but there were seven facultative anaerobes and three facultative aerobes. Detection of *Neisseria gonorrhoeae* in one patient after silver nitrate prophylaxis but in no instance after penicillin prophylaxis is instructive but not conclusive, the author states. But it does show that gonorrheal ophthalmia can occur after silver nitrate prophylaxis.

ROC. NEW YORK STATE A. PUB. HEALTH  
LAB., ALBANY

Penicillin and its crystalline fractions in the treatment of experimental syphilis. Charles M. Carpenter and Ruth A. Boak. 26: 4-6, 1946. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 3: 173-174, Mar. 1948.]

Interdependence of clinician and serologist. Augustus B. Wadsworth. 26: 24-26, 1946. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 3: 175-176, Mar. 1948.]

Cardiolipin and its application in a chemically purified antigen for the serodiagnosis of syphilis. Mary C. Pangborn. 26: 26-29, 1946. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 3: 179, Mar. 1948.]

The quantitative complement-fixation test for syphilis. Elizabeth Maltner. 26: 29-32, 1946. [Abstracted in Quart. Rev. Dermat. & Syph., 3: 180-181, Mar. 1948.]

ROC. ROY. SOC. MED., LONDON

Gold dermatitis, treated with B. A. L. Toxic manifestations? Related to calcium deprivation. Bernard Green and Brian F. Russell. 41: 110-112, Feb. 1948.

ROC. SOC. EXPER. BIOL. & MED., UTICA

A search for *Treponema pallidum* in the lymph nodes of the syphilitic mouse. Boris Gueft. 66: 405-407, Nov. 1947.

SYCHOSOM. MED., NEW YORK

Lumbar puncture reactions: relative importance of physiological and psychological factors. F. C. Redlich, B. E. Moore and I. Kimbell, Jr. 8: 386, 1946. [Abstracted in Am. J. Syph., Gonorr. & Ven. Dis., St. Louis, 32: 191-192, Mar. 1948.]

UB. HEALTH, LONDON

Some of the medico-social aspects of venereal diseases. W. V. MacFarlane. 61: 147-149, May 1948.

C. NEWS LETT., WASHINGTON

Drug allergies revealed. [Penicillin and streptomycin.] 52: 308, Nov. 15, 1947. Bacitracin goes on trial. 53: 23, Jan. 10, 1948.

SHADOW BOXER, CHARLESTON

Trends in post-treatment observation. 21: 2, Mar. 1948.

SOUTH. M. J., BIRMINGHAM

Effects of a new trivalent antimony compound upon granuloma inguinale. Gordon G. Allison. 41: 276-277, Mar. 1948.

\*Penicillin in drops for prophylaxis against ophthalmia neonatorum. A single instillation method. H. Charles Franklin. 41: 320-326, Apr. 1948.

\*The effect of caronamide on penicillin therapy. Herbert C. Sweet, O. P. J. Falk and

Drew Agar. 41: 326-334, Apr. 1948.

Treatment of condylomata acuminata with podophyllotoxin. Maurice Sullivan, Marion Friedman and James T. Hearin. 41: 336-337, Apr. 1948.

**Penicillin in drops for prophylaxis against ophthalmia neonatorum. A single instillation method.** H. Charles Franklin. South. M. J., 41: 320-326, 1948.

The author reports results of a study which was undertaken to evaluate the use of a single instillation of four drops of penicillin for prophylaxis against ophthalmia neonatorum. The report covers a 5-month period, during which time 1,177 infants were studied. The mothers of these infants were practically all charity patients of whom 85.3 percent were Negroes. The infants were studied in the nursery and in the home during the first 2 weeks of life. Crystalline sodium salt of penicillin was used, four drops being instilled into the conjunctival sac of each eye. The amount of penicillin used was the same as previously reported in the method of multiple instillations.

Aerobic, anaerobic, and carbon dioxide cultures were run on specimens obtained from the conjunctivas of infants exhibiting pus in the eyes while in the nursery, and, whenever possible, at home and after hospitalization. Thirteen (1.1 percent) of the infants exhibited pus in one or both eyes after penicillin prophylaxis while in the nursery. This percentage is approximately one-sixth of that observed in a previously reported series following silver nitrate prophylaxis. It is approximately one-half that observed when a multiple instillation method was used under less favorable conditions which the author discusses in detail.

A complete follow-up at home was made on a total of 952 infants, and pus was found in the eyes of 28 (2.9 percent) of these. This incidence differs only slightly from that found after using a multiple instillation method of penicillin prophylaxis (3.1 percent) and after using silver nitrate prophylaxis (2.4 percent). The author is of the opinion that the hygienic condition of the home and personal hygiene of the mother considerably influ-



ence results obtained in the evaluation of a method of ocular prophylaxis. There was no known instance of conjunctivitis caused by the gonococcus, either in the nursery or at home.

The various State laws regarding prophylaxis of ophthalmia neonatorum, the advantages of intramuscularly administered penicillin, and the development of sensitivity in the topical application of penicillin are dealt with in a discussion of this study.

**The effect of caronamide on penicillin therapy.** Herbert C. Sweet, O. P. J. Falk and Drew Agar. South. M. J., 41: 326-334, 1948.

The authors review the literature and present graphically the results of a study on the effect of caronamide on penicillin therapy. The methods and material used in the study are described in detail.

In an effort to establish optimum penicillin-caronamide dosage schedules, the following experiments were made. Three patients, 1 with empyema and 2 with latent syphilis, were given a trial phase of 30,000 units of penicillin alone every 3 hours parenterally for 7 days. For an additional 7 days, 1.5 gm. of caronamide were added every 3 hours. Daily penicillin levels taken 2 hours after injection showed that the average level on penicillin alone was 0.35 units per cubic centimeter of plasma, while the average level on caronamide plus penicillin was 0.78 units.

Three bronchopneumonia patients were given the same dosage of penicillin and after a 2-day control period, 3 gm. instead of 1.5 gm. of caronamide were added. Two-hour plasma-penicillin levels were taken daily. The average 2-hour level on penicillin alone was 0.45 units per cubic centimeter, while the average on penicillin plus 3 gm. of caronamide was 1.2 units as compared to 0.78 on 1.5 gm. In many of the cases treated it was observed that penicillin levels tend to rise with succeeding days on caronamide.

Observations were also made on reduced penicillin dosage with increased time intervals. In a group of 13 patients, the average 2-hour plasma-penicillin level

on 30,000 units of penicillin alone every 3 hours was 0.28 units per cubic centimeter. The average 3-hour level for patients receiving 20,000 units of penicillin plus 2 gm. of caronamide every 4 hours was 0.36 units. The average 3-hour level for 6 patients receiving 20,000 units of penicillin every 4 hours with 3 gm. of caronamide every 4 hours was 0.45 units. Thus, it would appear that 3 gm. of caronamide every 4 hours is a more effective dosage than 2 gm. every 4 hours.

Results of studies made to determine the effectiveness of caronamide in oral penicillin are presented. Twelve patients were given oral penicillin in dosages of 100,000 units every 4 hours plus 3 gm. of oral caronamide every 4 hours. This method resulted in effective blood levels comparable to those obtained with dosage of 30,000 units every 3 hours of parenteral penicillin alone. In each instance, after a period of 6 or 7 days, the caronamide was stopped and the penicillin continued for 2 more days in order to obtain blood levels for comparison. It was found that oral penicillin alone without caronamide resulted in very low blood levels in this series of patients.

Studies made to determine the toxicity of caronamide are reported. The drug showed no evidence of hepatic toxicity in 8 patients studied. Tests with 18 patients indicated that caronamide produced a depressing effect on the excretion of phenolsulfonphthalein by the kidneys. Because of this, the authors feel that the drug should be used in smaller dosage, or withheld in frank renal deficiency, although they observed no striking nitrogen retention from its use. In all, a total of 5 patients was given caronamide for periods of from 2 to 18 days. The only reactions observed were occasional nausea, vomiting, and rash.

In conclusion, an abstract of a discussion is presented in which the advantages of the joint administration of caronamide and penicillin are summarized.

SURVEY MIDMONTHLY, EAST STROUDSBURG  
Specialists and the Kinsey Report. Kathryn  
Close. 84: 113-120, Apr. 1948.

DSSKR. F. D. NORSKE LÆGEFORENING.,  
OSLO

Medfødt syfilis og dens bekjempelse. [Congenital syphilis and the campaign against it.] 67: 253-256, May 15, 1947. [Abstracted in Bull. Hyg., London, 22: 567, Sept. 1947.]

RAINED NURSE & HOSP. REV., EAST  
STROUDSBURG

Modern treatment of syphilis. W. Schweisheimer. 120: 361-364, May 1948.

S. NAV. M. BULL., WASHINGTON

A review of neurosyphilis. Robert E. Rock and Edward F. Mee. 47: 983-990, Nov.-Dec. 1947.

IRGINIA M. MONTHLY, RICHMOND

An evaluation of the annual serologic test performance studies conducted by the Vir-

ginia State Health Department from 1940 through 1946. E. M. Holmes, Jr. 75: 200-202, Apr. 1948.

WEST VIRGINIA M. J., CHARLESTON

Office treatment of syphilis with penicillin. Don V. Hatton. 44: 83-84, Apr. 1948.

WIEN. KLIN. WCHNSCHR., VIENNA

The origin of syphilis. [Über den ursprung der syphilis.] A. Wiedmann. 59: 281-285, May 9, 1947. [Abstracted in Quart. Rev. Dermat. & Syph., Washington, 3: 195-196, Mar. 1948.]

ZTSCHR. F. HAUT-U. GESCHLECHTS-  
KRANKH., BERLIN

Reinfektion bei syphilis. R. M. Bohnstedt. 11: 325, 1947. [Abstracted in Am. J. Syph., Gonorr. & Ven. Dis., St. Louis, 32: 193, Mar. 1948.]

## CURRENT NOTES AND REPORTS

### Examination for the Regular Corps

A competitive examination for appointment in the Regular Corps of the United States Public Health Service in the grade of assistant surgeon (first lieutenant) and senior assistant surgeon (captain) will be held in October. The written examination will be conducted October 4, 5, and 6, at places convenient to the candidates. The oral examination will be held at various points throughout the country.

All applicants must be at least 21 years of age and citizens of the United States, must present a diploma of graduation from a recognized medical school, and satisfactorily pass a physical examination performed by Public Health Service officers.

Physicians beginning internship on July 1, 1948, will be admitted to the examination. Successful candidates will be placed on active duty in the Regular Corps upon completion of internship on July 1, 1949.

Applicants for the grade of assistant surgeon must have had at least 7 years of educational and professional training or

experience, exclusive of high school. Applicants for the grade of senior assistant surgeon must have had at least 10 years of educational and professional training or experience, exclusive of high school.

Entrance pay for an assistant surgeon with dependents is \$5,011 a year and for a senior assistant surgeon with dependents \$5,551 a year. This includes the additional pay of \$1,200 for medical officers, as well as subsistence and rental allowance. Provisions are made for promotions at regular intervals up to and including the grade of senior surgeon (lieutenant colonel) and for selection for promotion to the grade of medical director (colonel) at \$9,751 a year. Retirement is authorized either at completion of 30 years of service or at the age of 64. Full medical care including disability retirement at three-fourths pay is provided.

Application forms may be obtained from Public Health Service Hospitals and District Offices, or by writing to the Surgeon General, United States Public Health Service, Washington 25, D. C.

## Streptomycin for Granuloma Inguinale

More than 100 patients have completed therapy with streptomycin for granuloma inguinale in a project supervised by Dr. John H. Seabury of the Louisiana State University School of Medicine, in an effort to learn the effect of various treatment schedules on the response of the disease and the relapse rate.

The work was undertaken in September 1947. Patients have been hospitalized in the Charity Hospital and in the Delgado rapid treatment center, both lo-

cated in New Orleans. Collaborating with Dr. Seabury have been Dr. David M. Dumville and Dr. F. P. Bordelon.

The investigation has been supported by funds obtained from Louisiana State University. Merck & Co., Inc., Rahway, N. J., made a grant of 6 kg. of streptomycin. The study has been carried on under the sponsorship of the Therapeutic Trials Committee, Council on Pharmacy and Chemistry, American Medical Association.

## Proceedings of Symposium of Syphilis Study Section

Printed copies of the proceedings of the symposium held April 8 and 9, 1948, under the auspices of the Syphilis Study Section, are now available through the Venereal Disease Education Institute, Raleigh, N. C. Those who signed registration cards at the meeting, held in the Department of Commerce Auditorium, will receive copies of the book without making further request.

The book, like the symposium, is entitled "Recent Advances in the Study of the Venereal Diseases." It includes all the papers read at the meeting and contains several hundred pages. For further information regarding the book address Frank W. Reynolds, M. D., Executive Assistant, Syphilis Study Section, National Institute of Health, Bethesda 14, Md.

## V. D. Article in *True Story* Magazine

The September issue of *True Story* magazine, now on sale, contains an article explaining to the layman the nature of some of the venereal diseases. Because many venereal disease patients are women in the same age range as the readers of *True Story*, it is thought that the article may be of interest to them. If this is true, it may be of value in patient education programs. It can be an asset to venereal disease control. Hospital and clinic directors may want to make available to their patients copies of the magazine.

Along with case histories of syphilis and gonorrhea patients, the author describes some of the ways in which venereal diseases are contracted, the symptoms, modern means of therapy, and the chances of obtaining a cure if the infection is not neglected. The case histories

point up the necessity for proper treatment and the ease with which it can be obtained. The article also emphasizes the importance of premarital and prenatal blood serologic tests for syphilis.

In obtaining information for the article, the author consulted several authorities on venereal disease, including Dr. Theodore Rosenthal, Director of the New York City Bureau of Social Hygiene, and Dr. Walter Clarke, Executive Director of the American Social Hygiene Association.

The author says "... The newspapers and magazines have stopped talking euphemisms about 'social disease' and now name names, in plain English. There is nothing forbidden about knowledge of venereal disease, nor does a desire to know about it imply an unclean or morbid mind. . . ."



# Western Venereal Disease Control Seminar

The following papers were presented before the last Western Venereal Disease Control Seminar of the United States Public Health Service. Copies of the digest of these papers will be released soon by Public Health Service District Office No. 5 to members of the seminar and to other persons requesting them.

## First Session

Psychological Considerations in VD Control

Dr. Henry C. Schumacher, Mental Hygiene Consultant, Public Health Service District No. 5, San Francisco

The University of California's Training Center in Family Life, Health, and Social Relations

Dr. A. Frank Brewer, California Venereal Disease Control Officer

Dr. Richard A. Koch, San Francisco Venereal Disease Control Officer

Syphilis among Mexican Laborers

Dr. L. J. Lull, Montana Venereal Disease Control Officer

## Second Session

The Present Modern Treatment of Early Syphilis

Dr. Joseph Earle Moore, Associate Professor of Medicine, Johns Hopkins University, Baltimore

The Limitations of Medical Treatment in VD Control

Dr. J. R. Heller, Jr., Chief, Venereal Disease Division, United States Public Health Service, Washington, D. C. (now Director of National Cancer Institute)

Should Epidemiology Be Done for Gonorrhea?

Dr. Gerald A. Heidbreder, Venereal Disease Control Officer, Los Angeles County Health Department, Los Angeles

Administrative Responsibility for Improving the Epidemiologic Index for Syphilis

Dr. R. R. Sullivan, Oregon Venereal Disease Control Officer

## Third Session

The Veterans Administration Program for VD Control

Dr. Bascom Johnson, Jr., Venereal Disease Control Officer, Veterans Administration, Washington, D. C.

Demonstrating that Private Physicians with the Assistance of the Health Department Can Control VD

Dr. W. Elwyn Turner, Santa Clara County Health Officer

The Private Physician's Part in a VD Control Program

Dr. Thomas H. Sternberg, Assistant Clinical Professor of Medicine, University of Southern California

The Importance of an Enlightened Public in VD Control

Dr. Thomas Callister, Salt Lake City VD Control Officer

## Fourth Session

Development of Immunity in Experimental Syphilis

Dr. H. J. Magnuson, United States Public Health Service, University of North Carolina, Chapel Hill

United States Marine Hospitals' Part in VD Control

Dr. T. E. Billings, United States Marine Hospital, San Francisco

Success of Patient Attendance in the Ambulatory Treatment of Syphilis

Dr. David Frost, Alameda City Health Officer

The Present Place for Ambulatory Treatment of Syphilis

Dr. James R. Malcolm, Alameda County Health Officer

## Percent Primary and Secondary of Total Syphilis Cases Reported to the United States Public Health Service by State and Territorial Health Departments, Fiscal Years 1941 and 1947

[Military cases excluded]

Area	Total syphilis	Primary- secondary	Total syphilis	Primary- secondary	Percent primary and secondary of total syphilis	
	1941		1947		1941	1947
District 1—Total.....	79,189	7,606	70,195	16,780	9.6	23.9
Connecticut.....	2,027	196	2,163	436	9.7	20.2
Delaware.....	1,543	121	1,003	364	7.8	36.1
Maine.....	718	202	901	483	28.1	53.3
Massachusetts.....	4,650	571	3,789	1,212	12.3	32.0
New Hampshire.....	308	21	360	100	6.8	27.2
New Jersey.....	10,568	1,143	9,670	2,019	10.8	20.8
New York.....	42,855	3,211	33,524	7,367	7.5	22.2
Pennsylvania.....	<sup>a</sup> 15,222	<sup>a</sup> 1,986	17,412	4,386	13.0	25.1
Rhode Island.....	1,124	99	1,096	252	8.8	23.3
Vermont.....	174	56	277	161	32.2	58.1
District 2—Total.....	84,141	16,107	48,723	18,467	19.1	37.7
District of Columbia.....	8,387	—	4,245	1,579	0	37.1
Maryland.....	10,887	1,204	7,670	2,379	11.1	31.1
North Carolina.....	20,167	3,319	9,034	4,404	16.5	48.1
South Carolina.....	18,562	6,270	8,028	2,608	33.8	32.1
Virginia.....	18,438	4,088	11,153	3,808	22.2	34.1
West Virginia.....	7,700	1,226	8,593	3,689	15.9	42.1
District 3—Total.....	64,565	8,710	71,489	20,418	13.5	28.1
Illinois.....	22,131	2,088	21,320	6,044	9.4	28.1
Indiana.....	6,766	1,286	7,057	2,117	19.0	30.1
Kentucky.....	6,930	1,095	6,527	2,683	15.8	41.1
Michigan.....	9,823	1,303	17,226	3,924	13.3	22.1
Ohio.....	17,699	2,698	16,976	4,980	15.2	29.1
Wisconsin.....	1,216	240	2,383	670	19.7	28.1
District 4—Total.....	153,777	20,739	103,980	29,928	13.5	28.1
Alabama.....	21,616	2,788	19,257	3,272	12.9	17.1
Arkansas.....	11,259	1,836	10,430	2,821	16.3	27.1
Florida.....	20,216	3,217	17,963	4,126	15.9	23.1
Georgia.....	20,960	1,178	11,974	3,789	5.6	31.1
Louisiana.....	<sup>a</sup> 9,899	2,023	14,593	4,680	20.4	32.1
Mississippi.....	50,224	6,588	17,946	7,207	13.1	40.1
Tennessee.....	19,603	3,109	11,817	4,033	15.9	34.1
District 5—Total.....	30,636	4,436	31,577	8,163	14.5	25.1
Arizona.....	2,018	309	1,475	638	15.3	43.1
California.....	22,882	3,085	25,058	6,070	13.5	24.1
Nevada.....	375	24	600	176	6.4	29.1
Oregon.....	<sup>a</sup> 1,433	<sup>a</sup> 334	1,536	511	23.3	33.1
Washington.....	2,931	521	1,979	624	17.8	31.1
Alaska.....	<sup>b</sup> 207	<sup>b</sup> 67	127	65	32.4	51.1
Hawaii.....	790	96	802	79	12.2	9.1
District 6—Total.....	1,088	198	7,888	976	18.2	12.1
Puerto Rico.....	<sup>c</sup> 1,088	<sup>c</sup> 198	7,759	952	18.2	12.1
Virgin Islands.....	—	—	129	24	—	18.1
District 7—Total.....	19,384	3,433	19,128	5,988	17.7	31.1
Iowa.....	2,603	434	1,717	650	16.7	37.1
Kansas.....	2,907	603	2,656	762	20.7	28.1
Minnesota.....	2,546	207	1,636	623	8.1	38.1
Missouri.....	9,391	1,702	10,036	3,131	18.1	31.1
Nebraska.....	958	241	2,216	465	25.2	21.0
North Dakota.....	393	91	328	159	23.2	48.1
South Dakota.....	586	155	539	198	26.4	36.7
District 8—Total.....	5,840	1,474	4,141	1,401	25.2	33.8
Colorado.....	3,741	990	2,042	723	26.5	35.4
Idaho.....	354	123	787	230	34.7	29.2
Montana.....	338	80	459	177	23.7	36.2
Utah.....	908	139	460	128	15.3	27.8
Wyoming.....	<sup>a</sup> 499	<sup>a</sup> 142	363	143	28.5	39.4

See footnotes at end of table.

Percent Primary and Secondary of Total Syphilis Cases Reported to the United States Public Health Service by State and Territorial Health Departments, Fiscal Years 1941 and 1947—Continued

[Military cases excluded]

Area	Total syphilis	Primary- secondary	Total syphilis	Primary- secondary	Percent primary and secondary of total syphilis	
	1941		1947		1941	1947
District 9—Total.....	41,306	5,616	24,992	5,593	13.6	22.4
New Mexico.....	1,450	330	1,507	537	22.8	35.6
Oklahoma.....	8,501	1,162	7,699	1,626	13.7	21.1
Texas.....	31,355	4,124	15,786	3,430	13.2	21.7
Alaska.....			312	58		18.6
Total continental United States.....	477,841	67,958	373,296	106,594	14.2	28.6
Total United States and Ter- ritories.....	479,926	68,319	382,425	107,772	14.2	28.2

- <sup>a</sup> Includes estimate for 1 month not reported.  
<sup>b</sup> Includes estimate for 2 months not reported.  
<sup>c</sup> Data for 1 month; reporting began in June 1941.

Source: Form PHS-688 (VD) (Old No. 8958-B) USPHS—Venereal Disease Division, Office of Statistics 9/48 (ML-RR) mjb.







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FEDERAL SECURITY AGENCY  
PUBLIC HEALTH SERVICE

### **Submission of Manuscripts**

In order to facilitate the handling of manuscripts submitted for publication in the JOURNAL OF VENEREAL DISEASE INFORMATION, the editor requests that copy be prepared in triplicate, typewritten, double-spaced, with liberal margins. Statistical tables and charts should be set up according to the style used in the JOURNAL, and should be presented on separate sheets, rather than within text material.

## **FEDERAL SECURITY AGENCY,**

**OSCAR R. EWING, *Administrator***

## **PUBLIC HEALTH SERVICE**

**LEONARD A. SCHEELE, *Surgeon General***

**Editor: THEODORE J. BAUER, *Medical Director*  
*Chief, Venereal Disease Division***



**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office  
Washington 25, D. C. - Price 10 cents. Subscription price: Domestic, 75 cents  
a year; foreign \$1.15**



## Editorial

Health departments will be interested in a recent statement issued by Dwight D. Eisenhower, president of Columbia University, to the New York City press urging the radio industry to throw its support behind the country's venereal disease program.

"We need your help," he said. "The campaign against VD must succeed, and radio with its impressive record of accomplishment in the public interest can be one of the most potent factors in that success."

President Eisenhower's statement, addressed to the radio stations of America, was incorporated into the radio booklet, "A Job That Needs You," which currently is being distributed through State and local health departments to the radio stations in their communities.

Actually, this appeal demands application far beyond radio. It is an appeal to every responsible individual in every American community. Venereal disease control is a public problem, and, as such, a community problem. No particular group, civic or professional, assumes sole responsibility for control. The Surgeon General of the United States Public Health Service is charged by the Congress with *assisting* "States and their political subdivisions in the prevention and suppression of communicable diseases." But this "assistance" is dependent on continuous and positive community action.

Of syphilis and gonorrhea only, among the still wide-spread communicable diseases, it can be said that: The treatment is inexpensive and efficient, the facilities are at hand, the causative organisms and their mode of transmission are well known, and an enlightened public opinion demands control.

The challenge, therefore, is directed at the community. And the Public Health Service stands ready to assist any State in the country to carry out on a State-wide or community basis such demonstrations as will find more cases of venereal disease and get patients to treatment before the infection can be spread. Assistance can be provided in terms of money, personnel, and materials.

The radio programs that prompted President Eisenhower's appeal to the radio station managers of America are now available through Public Health Service district offices, and there will be more. Public Health Service assistance may take many forms, but,, like all useful things, it is dependent upon the extent to which it is put to work.

# The Modern Venereal Disease Problem and Its Sex Education Front<sup>1</sup>

John H. Stokes, M. D.<sup>2</sup>

"Mankind has never been in this position before. Without having improved appreciably in virtue or enjoying wiser guidance, it has got into its hands for the first time the tools by which it can unfailingly accomplish its extermination. That is the point in human destinies to which all the glories and toils of men have at last led them. They would do well to pause and ponder upon their new responsibilities."

Churchill was speaking in 1929, of the destructive force of armament—actual, potential, and foreseeable—upon the life of the world. The poignant imminence of fulfillment of these prophetic, winged words applies not alone to the physical destruction of mankind, but to a situation in his emotional, moral, and social life which is as capable of annihilating his spirit as the atom blast is able to bring his body to the instant dust. One facet of this problem in destiny is before us today. What is the human being—the bisexual animal who by the grace of God has created the holy family, and colored all of life with the passion and the selflessness of love—about to do with the tools he has got into his hands for the first time, with which he can unfailingly undo all that the glories and toils of men and women have accomplished. We shall do well to ponder as basic to our new responsibilities (again in Churchill's words) certain somber facts which emerge solid, inexorable, like the shapes of mountains from drifting mist.

As a man thinketh in his heart, so is he. But like a puppet he is pulled this way and jerked that by combinations of forces,

some originating in perhaps gene-determined patterns in the thalamus, others from environmental influences that impinge upon him early in life, or from endocrine and nutritional agents which are unsensed, and hence unreasoned. He swayed by trends, he is rushed like the lemming, uncomprehending, into the sea of self-destruction. He climbs obstacles and plants flags on pinnacles with little understanding as to the whys and wherefores of many of his exalted and triumphant acts. He is the perpetual and defatigable thrower of boomerangs, a moment striking his objective square, the next reeling under a rebounding fort that comes back at him out of the blue into which he hopefully hurled his strength and skill.

I indulge in these few words of poetic description of the human being with intent to loosen and soften up, and attempt to impersonalize, our thinking about him as we come to an examination of his social life. Yet while I urge you to think of his handicaps, and of the blind unreason and the seemingly almost predestined frustration or destructiveness of so many of his acts; and while I venture to plead that the freedom to make mistakes and to learn from them is an essential freedom, I want nothing that I say to be construed as releasing man from responsibility for his moral nature, and to the right and wrong of things, to the heritage or to the developmental potential that makes him the primate of primates—man the idealistic, the religious animal.

Here then is the first evaluative principle: human life can never be adequately discussed, or plans drawn for its better fulfillment without linking the spirit with the flesh, the soul of man with the body, the intelligence with the emotions, to act with its moral and social responsibility, conduct with conscience, pleasure with duty.

If once this position is conceded, or

<sup>1</sup> Read before the Section on Venereal Disease Control of the Medical Society of New Jersey at its 182d Annual Meeting, Haddon Hall, Atlantic City, N. J., Apr. 29, 1948.

<sup>2</sup> Professor of Dermatology-Syphilology, Graduate School of Medicine, University of Pennsylvania; Director, Institute for the Study of Venereal Disease, University of Pennsylvania; Consultant to the Secretary of the Army.

draw a deep breath of understanding over many of the knottiest problems of the physical and emotional life, and specifically the sex life of human beings. Only a week or two ago a group of us was confronted with an agenda which purported to appraise the national problem of health under three heads: morbidity, mortality, and cost of illness. It is refreshing to see the immediate objection to such a categorizing of health, any of the finest manifestations of which are on the intellectual, the spiritual, and the social side, and which are accompanied by heavy debits in morbidity, mortality, and cost. Is it not necessary to appraise a health program in terms of spiritual and intellectual accomplishment, needs, and shortcomings quite as much as it is to rate it in sick bodies, crippled frames, and corpses? The health of man, the health of any of his activities and expressions, is as much a function of his moral, social, and biologic adaptation of his mechanical or tissue fitness and health.

So it is with the problems of sexual health. To think of them solely in physical terms, to think solely of bodies and parts, leads us into a mechanimetric maze, a robot automatonism, a Kinseyish substitution of numerals and taxonomy for science, and a mistaking of merely quantitative science for the whole truth. The tendency to construe sex as an act, the parts that participate as the whole meaning and substance of relationship, the seasons that accompany and ensue as the sense of the consequences, the preservation of a sound body by condom and kit as the principal objective while throwing the winds the defeated procreation and desteppeped responsibility, are all parts of the morbidity-mortality-cost type of thinking applied to man's broadest field of combined emotional, spiritual, and physical activity. We are in the grasp of such a lop-sided view of things today. The "shack-up" technic and sexual commissary set-up overseas or at home; the "if you can't be good be pro(phyllacetic)" of the last war; the growing lubricity of print and film; the fading fabric of

our family and marital linen washed in the public eye, are all tarred with the same brush. Sex is now a physical property, like a car: a lure hung with furs, a smell with a suggestive name, something with a three-way stretch and seductive points—to be acquired, used, traded in for a newer model or rented for the occasion or the night like tie and tails; an instrument of amusement, conveying no responsibilities.

That this deterioration in the status of sex is the product of our own best efforts to better the place of man in his universe is the authentic tragedy of it all. Setting out to master the chemistry of hydrocarbons we introduced gasoline and the internal-combustion engine, and by polymerization, the rubbers, to the world. In a moment of disarming frankness, ask yourselves what gasoline and rubber have done to the sex life of man. They have shifted or abolished the locus and the responsibility, and contributed to the crippling of the stabilizer, the family and the community pressures of the established home. Setting out again to relieve the overburdened and ill mother, and the economically hard-pressed couples whose ability to support a family we have never more than halfway encouraged, we removed a large part of the fear of pregnancy from the inhibition of promiscuity. We have even created a black market in illegitimate babies by our well-meant tamperings with fundamental sexual mechanisms. And we have indulged in wars, which are fundamental removers of controls on the moral side, inevitable producers of short cuts to not always fully examined ends, like induction of potential homemakers into armies and industry; defeminization of women; de-parentalization of children; collapse of the housing structure of family organization, which, as Dorothy Dix has well said, is the other side of divorce. And we have brutalized procedure, substituted arrogance for humility, put a price on everything, justified it by salability, and carried the general debauchery of sex down the line to the teen-ager and the child.



And dreariest paradox of all, our efforts to better the state of mankind by the conquest of disease seem in the case of venereal disease to have been working in reverse. Just as contraception has freed the woman from one type of consequence of the sexual act, the miracle drug seems to have freed both sexes from the other—the fear of bodily harm. Mass information has it that the “clap” is now less troublesome than a cold, and syphilis likewise. And the sour part of it is, that it is true, or soon will be so far as the individual course of infection is concerned. But of incidence as distinguished from morbidity, it is not and possibly can never be true short of a simple and universally applied immunization, for which we are hunting with all our best brains but as yet with only straws of achievement to point the possible direction of the wind. Every physician should have at his tongue's tip the three basic facts on which these statements rest. The venereal diseases have an almost asymptomatic but infectious onset, an appreciable period in which the need for treatment is not urgent enough to force the disseminator into competent diagnostic and therapeutic hands. During this period he exposes X uninfected individuals, 50 to 70 percent (1) of whom will develop his disease, many of them before the expensive, tedious, and only partially successful effort of contact tracing catches up with them, and during which lag period they in turn become disseminators. The second basic fact is hidden in the thicket of failure rates, the margin as yet uninterpretable, of noncure even with penicillin at its best. Here is the source of the relapse reservoir that maintains the venereal diseases unrecognized, uncured or incurable, as carriers maintain other infections. It was revealing to hear Ambrose King (2) reiterate for gonorrhea the penumbra of doubt that shades for some observers our present almost unqualified optimism.

In syphilis, as you well know, we also have had the reinfection versus relapse problem to deal with; the uncertainty as to whether the reappearance of new infec-

tious lesions represents treatment failure or a new infection. Here enters the thir-  
 reason or basic fact qualifying our hope for the extinction of venereal disease treatment. Short, quick-acting treatment given early contributes quick cure but no immunity. Reinfection promptly follows re-exposure, often to the identical source of the first infection. How much the older, slower, arsenic-heavy metal therapy contributed by its dragged-out course to the protection of the individual and hence the public by permitting the development of immunity to reinfection while controlling relapse, we shall not probably never know. But the ratio given to reinfection of cured nonimmune as a fact and, by inference, to it as a means of maintaining incidence in the face of increasing therapeutic simplicity and speed, is high and getting higher daily. New terms are even needed to identify the current state of affairs, the most ingenious of which is Graham's “ping-pong syphilis” (3), now reduced to a diagrammatic form of representation by Schaberg and Steiger (4).

In the face then of a public faith in miracle drugs, we encounter the reality of the probable failure of our latest and most effective therapeutic methods not only to control incidence, but to assure cure. The search for more effective penicillins and combinations will go on; the spread of treatment will perhaps be widened as in Schoch and Alexander's (5) latest experiment, by the treatment of identifiable contacts by a 1-day “prophylactic” course; husband and wife or sexual partner will be simultaneously treated though only one has evidence of infectious disease. But the margins of error and failure and inevitable ineffectuality will still exist. Public optimism and public acceptance of disease as a negligible drawback to promiscuity can be expected to do what it is doing; make simplified effective treatment a spreader of disease. Again we see an attitude at work. One of its alarming paradoxes is illustrated by a recently reported conversation between patient and clinician at a treatment center.

"I don't have to tell you where I got it. I got it, ain't I? So what? I'm a taxpayer! Gimme that shot!"

At least we should not be walking in our sleep as we approach the day when the drugs put the community in the position of subsidizing venery.

The break-down of public health confidence in the adequacy of treatment as a means of doing away with a great class of infectious disease has been a spectacle of the ages, a confounding of the prophets, and an humbling of those who are unwise as to write books. Wisely, and with good grace, public health authority shifting its attitude, and turning to the long-despised promiscuity of man (see Kinsey) as the cause of persistent venereal disease. The hard-bitten health officer now rates syphilis and gonorrhea collectively, not as a *Ding an sich*, an entity, but as a symptom of social sickness, the malady of an unadjusted human sexual life. Venereal disease is now a telltale, an indicator, not the problem itself.

One more interpolation before we examine the implications of such a decision, which is a shift of front. What of prophylaxis, the employment of methods to prevent or abort, in the presymptomatic stage, the infection that may follow exposure? First let us concede, even insist, that prophylaxis, station administered, under disciplinary control (note the word "discipline") has had a good, in some situations even a remarkable, record. When its time factor, its alcohol-inhibition factor, its intrinsic inopportune-ness, and its repellent messiness can be overcome by force of one sort or another, it is workable. But when its use is left to the will of the user, it fails. It failed in spite of a most intensive educational campaign, an all-out advocacy, a descriptive (one might almost say seductive) propaganda that used every available resource to sell itself to millions of men under arms in our latest war. It cannot be flatly asserted that it did no good, of course. But it did not accomplish enough to allay the most serious misgiving—misgivings involving not alone medical effectiveness, but moral fitness, conduct unbecoming a soldier, which constituted, in

its official sanction, a betrayal of family, home, church, and social order. It is those misgivings that have found new voice in the present policy of the Army, which has removed prophylaxis from the front of venereal disease control, and, while making it available under medical direction to the undisciplined and uncontrolled, comes forward definitely to subordinate it to morale.

Yet even prophylaxis has not had its ultimate test. So close is that consummation in the new phenarsine compound (recently the subject of a pilot experiment) that we "chaplains," as we are derisively called, are holding our breath.

You will all realize that I have left untouched for lack of time, and because I have discussed them elsewhere (6), such approaches to the venereal disease prevention problem as the sanctioned and controlled bordello and the segregated district and the stockade. I now offer, therefore, to bring all these threads together into four summaries of what appears to be basic material for this field. The first is a parallel-column analysis contrasting the old with the new thought on the treatment control of venereal disease. The second summary is a parallel-column analysis of the forces acting for and against promiscuity in modern life. The definition was prepared by a panel<sup>3</sup> sitting with the class in the fifth course in Health and Human Relations at the University of Pennsylvania in 1947. The third summarizes the question, "Is sex education needed, and if so, what kind?" The fourth parallels the home and the school as theaters and instruments of education in what we rightly call "health and human relations."

In this first analysis, bear in mind that the old thought is to the left, the new to the right.

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<sup>3</sup> Definition evolved by a panel, "Questions the Lay Public Asks in Social Hygiene and How They Should be Answered": Kenneth E. Appel, M. D., Assistant Professor of Psychiatry, University of Pennsylvania; Emily Mudd, Philadelphia Marriage Council, and John H. Stokes, M. D., Director, Course in Health and Human Relations, University of Pennsylvania, Philadelphia, Pa., July 21, 1947.

**Figure 1.—The shifting viewpoint and experience on treatment control of venereal disease**

### ***The Old Thinking***

1. Venereal disease is caused by the spirochete, the gonococcus, the virus of the disease in question.
2. Venereal disease (syphilis) can be reduced by the development of immunity of infection. In the infected but cured person it prevents infection.
3. In the uninfected, effective immunization would prevent infection in the first instance.
4. Venereal disease can be stopped by finding and treating every infected person who is in an infectious stage.
5. And by treating him on sight with an immediately effective sterilizing agent.
6. But the agent must cure 100 percent of cases without relapse.
7. Treatment must be short. Pack it into one quick wallop and save lapse and follow-up.
8. Treatment must be easy, reactionless.
9. We should treat only on diagnosis. Develop every possible test and apply to every possible person, to make a diagnosis.
10. We must wait for incubating infections to become manifest.
11. This plan fails because it—
  - (a) Can't find all contacts;
  - (b) Can't hold them while waiting;
  - (c) Can't prevent spread while symptoms are unrecognized.

### ***The New Thinking***

1. Venereal disease is perpetuated by the agency or act that brings uninfected into contact with infected person.
2. Immunity of infection exists (syphilis) but it takes time to develop and stops developing if the infection is quickly stopped.
3. No artificially induced immunity exists.
4. Case finding is (a) expensive, (b) slow, (c) uncertain. Individuals in an infectious stage may have no lesions recognizable to self or others. Sixty percent of infected persons never report for early treatment.
5. On sight is rarely possible and delay may have infected others. We have the sterilizing agents.
6. The failure rates in syphilis (4 to 30 percent) defeat us by maintaining the infective reservoir.
7. The quicker the treatment, the sooner the scare is over; the sooner re-exposure and reinfection occur.
8. This, with 6 and 7, removes the fear of infection, boosts exposure rates, brings more infections and reinfections.
9. Since infallible early diagnosis is impossible and blocks the extinction objective, and since relapse is still a fact, and since relapse and reinfection are indistinguishable, reinfection probably common, and since treatment is virtually unobjectionable and without risk,
10. We must now treat on suspicion. We must treat on exposure (contact), which creates suspicion.
11. This plan fails because it—
  - (a) Can't stop re-exposure and reinfection of nonimmunes.
  - (b) Can't find all contacts.
  - (c) Can't enforce preventive treatment.



Figure 1.—*The shifting viewpoint and experience on treatment control of venereal disease—Continued*

<i>The Old Thinking</i>	<i>The New Thinking</i>
12. All plans fail unless 100 percent are cured.	12. All plans fail that depend on— (a) Cure less than 100 percent; (b) Cure without immunity.
13. Proceed against infection then by prophylaxis; a method of qualified value at best, a failure under voluntary control.	13. Go back to 1, and proceed against exposure by a new attack on promiscuity. Admitted grudgingly by old-line thought, it now rates higher.

The logical next step is to analyze promiscuity after defining it, or attempting to do so, avoiding if possible purely numerical standards of numbers of partners or coiti, and attempting to get at an essence or inner meaning of the phenomenon. Here the contrast between what seems practical or exists, and what might be conceived as desirable or ideal-

istic, gives the right-hand column a warp influenced by even such highly subjective and even endocrinologic (I might even say interstitial) issues as the age and experience of the discussor. The analysis runs the risk of being called do-goody, YMCA-ish, hypocritical, unachievable, and even guilty of the common error of interpreting failing vitality as virtue.

Figure 2.—*A definition of and influences affecting promiscuity, the cause of venereal disease*

<p><b>DEFINITION:</b> Sexual intercourse conducted on a casual and ephemeral basis, without regard for responsibility, social and family relationships, and enduring love.<sup>4</sup></p> <p>[NOTE: In the ensuing parallel-column tabulation, asterisks indicate functions of education in venereal disease control.]</p>	
<i>Favoring Promiscuity</i>	<i>Opposing Promiscuity</i>
1. Psychological immaturity, abnormal parent-child relationships, broken homes, deep-seated resentments, physical precocity.	1. A united home, adjusted tensions, available and adequate sublimation and tension-discharge mechanisms (work and play).
2. Social pressures and mores at lower educational levels.	2. Birth into, or elevation to higher educational levels.*
3. Bad example, in and outside the home, in superiors and inferiors. Not all gutter raising.	3. Good example,* individual and collective (social type).
4. An increased sexual tempo. Climatic and racial influences, and the effects of "sexualization" and war.	4. Restraints, actuated by "good taste," self-respect, social responsibility, family ties, and mores.
5. Sexualization in clothing, books, art, advertising, radio, cinema.	5. The "Legion of Decency" idea.
6. The decline of "character." Best exemplified in lessened "fair play" and the growth of the "gyp."	6. A renewed emphasis in home, school,* club, and church on character building at large.
7. The decline of discipline.	7. Discipline in the family, in the school,* in the armed forces.
8. The single standard of license, replacing the double standard of morals.	8. A revival of the family as a goal and career.

<sup>4</sup> See footnote 3, page 299.

Figure 2.—*A definition of and influences affecting promiscuity, the cause of venereal disease—Continued*

**Favoring Promiscuity**

9. Frustration of, or inadequate provision for, normal outlets in marriage, family, and home.
10. Displacement, maladjustment, and restlessness of women, the former stabilizing force.
11. Displacement of men from home responsibility.
12. Mechanized civilization and its tension-raising imbalance between food intake and energy output.
13. Certain attitude trends:
  - (a) Hedonism—pleasure for its own sake and its substitution for duty. Sex is becoming a pleasure cult.
  - (b) Cynicism—of the “intellectual minority”—the inborn involutional disease of civilizations. “Cui bono?”
  - (c) Pseudoscientific attitudes.—“What is, is right”; Kinsey is right, so whoopee!
  - (d) Laissez faire and the decline of the differential between right and wrong. A pitfall of democracy.
  - (e) False concepts of happiness as an end in itself lead to a superficial adventurism.
  - (f) The doctrine of inalienable sexual right.
  - (g) The doctrine of imperative necessity.
  - (h) The doctrine of fixed sexual pattern set between 14 and 16.

**Opposing Promiscuity**

9. Subsidization, expansion, educational development of marriage as a career;\* and the properties, physical, emotional, and intellectual, for a home.
10. Redirection of women from an imitation of or competition with men, to something nearer their former role of world dominion through home and children. “The hand that rocks the cradle . . .”
11. Return of men to a larger share in home partnership and child raising.
12. A return to the land and the feet, the view, and the walk. Tension discharge by the long muscles and the manual skills.
13. A new alignment, started early in life in home and school\*:
  - (a) Putting fair play and duty first and pleasure second. The Scouts.
  - (b) A revival of faith in welldoing to be begun by physicians, the sourest cynics of them all.
  - (c) Admission of moral judgments and idealistic measurements into Kinsey’s and other taxonomies.
  - (d) A new assertion of the everlasting yeas and nays; the right and wrong of it. Liberty—but with responsibility.
  - (e) A teaching of happiness as a by-product of duty done and conscience heeded,\* not an attainable end in itself.
  - (f) In a relation involving always two, then three and then the race, there can be no sole inalienable right, believe it or not.
  - (g) Teach early that a man has a will, intelligence and reason to control emotion,\* a cortex to dominate his thalamus.
  - (h) Act as if man were educable\* from birth to death—as he is.

**Figure 2.—A definition of and influences affecting promiscuity, the cause of venereal disease—Continued**

### ***Favoring Promiscuity***

(i) Psychiatric coddling: the doctrine of avoidance of conflict. The fear of frustration.

14. The disappearance of fear from the motivation of sex behavior:

(a) Fear of disease removed by modern treatment.

(b) Fear of pregnancy removed by contraception.

(c) Fear of social consequences countered by black market in illegitimate children.

(d) Fear of God.

15. The successes and advances of modern treatment:

(a) The myth of the miracle drug with the 100-percent cure.

(b) The breaking of rapport with the patient.

(c) Cure without discomfort or inconvenience or loss of time.

(d) Cure at State expense.

16. The failure of modern treatment:

(a) The noncure margin of 4 to 30 percent.

(b) Cure without immunity.

(c) Cure without responsibility.

17. Rise of the facilitators:

(a) *The automobile*.—Greatest implement of venery since the invention of the bed.

(b) *Alcohol*.—The ounce too much. Out of control.

(c) Expanding commercialization of vice. (*See also* 5).

18. The housing problem. The "other side" of divorce. The apartment and the car, the resident in-law.

19. Marital boredom—fed-upness.

### ***Opposing Promiscuity***

(i) Teach conflict as integral to life\*—physiologic; struggle salutary; frustration educative and endurable; complexes resolved by time and work (Kretschmer).

14. The disappearance of fear from the motivation of sex behavior:

(a) A serious but not irreparable loss. Be honest. Tackle the problem without reference to it. Try to replace with a positive idealism.

(b) Same as (a).

(c) Bear down hard on fair play\* and responsibility.

(d) The reincorporation of religion into education.\* Substitute "love" for "fear" and teach it with all our might.

15. The successes and advances of modern treatment:

The gravest and most unanswerable paradox in the physician's and the health worker's field today. Modern treatment spreads disease. The answer is immunization and the broad attack on promiscuity.

16. The failure of modern treatment: The same.

17. Rise of the facilitators:

(a) The "hottest" modern problem, and the most crying need for study. No answer in sight.

(b) The characterologic leads. Alcoholics Anonymous, carried down into adolescence.

(c) Systematic and determined repression in all its forms.

18. Every pair its house alone, every child its cellar door and apple tree; every wife her garden, pig, and chickens; every man his hobby shop.

19. Organized baby-sitting and the step-out-together.



**Figure 2.—A definition of and influences affecting promiscuity, the cause of venereal disease—Continued**

<i>Favoring Promiscuity</i>	<i>Opposing Promiscuity</i>
20. No place for youth—or the child.	20. One-third of the habitable part of the earth devoted to children's play and adolescents' youth centers; 24 hour use of schools,* etc.
21. Wars, two in a generation : ( <i>a</i> ) Population shifts, breakup of home and neighborhood ties, social and sex bonds and pressures; result, floaters. ( <i>b</i> ) Industrialization of women. ( <i>c</i> ) Bad housing. ( <i>d</i> ) Mass teaching of prophylaxis as an out for moral weakness.	21. Wars, two in a generation : A reorganization at least of the armed forces' indoctrination on sex hygiene and conduct.* Such a reorganization is in progress.

**Figure 3.—Is sex education needed? And if so, what kind?**

1. Unless promiscuity and disease are accepted as the normal, education is needed.
2. Sex education is not education in the mechanics of procreation alone, but education in a satisfying and fulfilling life, of which sex is an essential part.
3. Sex education is no different, then, from education for any other mode or form of living; it involves the same habits of disciplined reaction, the same acceptance of responsibility, the same emotional coloring, the same elementary fidelities, loyalties, and cooperations as any other education for living.
4. It is a part of the field of "health and human relations."
5. It should be taught from parenthood to parenthood—from one generation through the next in a full human cycle.
6. Sex education should be taught as part of a course in personal physical and mental hygiene which extends through the entire formal schooling, as part of general science and biology, as social studies, as physical education and even as literature, the arts, business practice, and training for the professions, teaching, law, medicine, architecture, etc.
7. The business of sex education is to place reason in control of emotion without emotion losing its colorful and revivifying vitality.
8. The first need is to train adequate teachers to work as teachers (*a*) of teachers, (*b*) of parents, (*c*) of the preschool child, (*d*) of the pre-adolescent school child, (*e*) of the early adolescent school child, (*f*) of the late teen-age group, (*g*) of the marriageable and about-to-be-married, (*h*) of the family in distress, and (*i*) of the public. Each group presents its problems and technic, but fits into a general and cohesive and progressive plan.
9. Too often the "education" starts in the late teen-age group and reverts to education in the mechanism of procreation and warnings about venereal disease.
10. The physician's special opportunity lies (*a*) in setting an example of belief in the need; (*b*) in faith in its prospect of success; (*c*) in supplying facts; (*d*) in work with parents, the about-to-be-married, the family in distress, and the public.

The final group of problems centers about the question, "Who shall do the job?" The problem as between home and school is the most widely discussed to-

day. The participation of the church can be mediated through both, if the churches will bestir themselves. The left-hand column is the home, the right the school.

**Figure 4.—Sex education—home and school**

### *Home Sector*

1. The home is the seat of the family (as was), the sex-created basic physical and idealistic human unit. Now greatly weakened in many directions.
2. From birth to college (and before birth), the prime educative force.
3. It has the child in the critical formative years (1 to 6) of unselfconsciousness.
4. Has the chance to teach by example, too often poor.
5. Has natural visual aids, the bath and bedrooms, animal families, etc.
6. Is under the direction of two self-conscious and often uninformed and tongue-tied parents.
7. Parents stymied by prudery and taboo and lack of vocabulary.
8. Objectifies with difficulty.
9. The home is the theater of life in many-sided personal relationships.
10. Can (or could but doesn't) control subversive "outside" information and influence.
11. The natural theater for the religious influence and idealism.
12. Holds a position of declining authority.
13. Is shirking or failing in its responsibility for (a) self-discipline, (b) psychologic adjustment, (c) medical guidance and aid, (d) the play outlet.
14. Can initiate little, through ignorance of parents as to need and where to get help.

### *School Sector*

1. The school is the instructional center and elbow-rubbing workshop of the formative years.
2. From age 6 to 25; for most, from 6 to 18.
3. It has the 6-12 partly initiated group, and the sex-dominated adolescent.
4. Has to teach largely by precept; some by counsel.
5. Must formalize and denature visual aids.
6. Is under the direction of (a) one sex, (b) with sex self-consciousness, (c) but some specialized though (d) too-compartmentalized knowledge which is (e) partial and (f) inaccurate.
7. Teacher lopsided by inexperience or neurotic constitution.
8. Is better trained to objectify.
9. The school is the theater of formalized teaching and culture, and the ethics of fair play.
10. Has little control over, and provides some facility for subversive information and influence.
11. Little or no religious influence.
12. Holds a position of increasing influence and prestige.
13. Is growing in disciplinary influence, psychologic aids, physical supervision, the play outlet.
14. Can initiate parent education and cooperation direct and through counseling.

**There is no antagonism between home and school. Each can supplement the other, and the school can help the parent. Today's problem is that home wants school to do it, and school is unprepared.**

I am sure you will have no difficulty in appreciating the complexity, and the urgency, of the promiscuity and sex-education problems. That so large and so stable a body as the Army is feeling its way toward extended and radically new approaches and believes that education from the standpoint of morals, the duty of the soldier-citizen, self-discipline based on knowledge and idealism, is an effective antivenereal agent, is a significant endorsement. The physician is a key person in all such approaches. He is still enough of a high priest in his standing in the community and in closeness of his relations to his patients to make his acts, his words, and his unspoken attitudes vital. During the war I had occasion to see over and over how such attitudes in individual medical officers, and in county and State medical societies, influenced the local control of venereal disease. May I say that some physicians have too easily let themselves believe, as an "intelligent minority," so-called, that the "Christers" are out to sack the God-given freedom not mentioned in the Atlantic Charter, the right to sexual self-expression. And whether they are or not, man is an animal anyhow—and what he has been, he'll remain, so what's the use? The only answer I know to that kind of cynicism, and the pseudo-science that underlies it, is personal. In what kind of a world do you want your son, your daughter, to grow up? Do you want him punching the teeth out of the

face of a girl who refuses him? Today's evaluations show us that's the way the amoral attitude is headed. The physician has his ethical, his moral, his personal responsibility for the future. I want him to act, and with conviction!

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# The Tabloid Newspaper as a Medium of Mass Public Venereal Disease Education

Charles R. Freeble, Jr., M. D.,<sup>1</sup> and Arthur Robinson<sup>2</sup>

An excellent opportunity to evaluate a continuous newspaper campaign against venereal disease was offered recently in Ohio. The newspaper series extended over a 6-month period, and the cumulative effect of such a program was amply demonstrated.

The newspaper articles were prepared as a cooperative venture by the staff of the Central Ohio Rapid Treatment Center working with Community Health Services, a health education agency supported by the Columbus, Ohio, Community Chest.

Community Health Services is a unique agency which came into existence in the summer of 1947 as a pioneering project of the Columbus Community Chest. It is an independent health education agency, designed to work in conjunction with existing health agencies, public and voluntary, in reaching the public with health information through such mass media as newspapers and radio. The executive director is a veteran newspaper and radio man. The board of directors includes physicians in public health work and in private practice, and representatives of the local cancer and tuberculosis societies, public schools, Ohio State University, and the Red Cross. It also includes lay members who are expert in public relations, plus representatives of each of the major newspapers and the principal radio stations in the community. The medical officer in charge of the Central Ohio Rapid Treatment Center is on this board.

It was decided early in this project that venereal disease should be one of the first targets of this new agency. Plans for the campaign were developed in conference

between the agency executive and the medical officer in charge of the Rapid Treatment Center.

The newspaper chosen for the campaign was the *Columbus Star*, a weekly tabloid published in the same plant as the *Ohio State Journal*. The *Star* had at that time a circulation of approximately 90,000, about half in Columbus, and half scattered over the rest of Ohio.

Mr. John Bohannon, Editor of the *Star*, welcomed the proposal for a series of human interest case histories of patients at the Rapid Treatment Center. He agreed to give these stories prominent display and offered to have a staff artist prepare illustrations to accompany the stories.

The original intention was to run a series of 6 articles. The management of the *Star*, however, discovered such reader interest in the series that they asked for more. In fact, the series might have been continued indefinitely, but it was decided to close the series at the peak of interest rather than to allow interest to lag. A total of 23 case histories appeared. These were followed by a single article which summarized the factual information about venereal diseases. A twenty-fifth article outlined some of the results obtained by the series and included a letter from Dr. Leonard A. Scheele, Surgeon General, United States Public Health Service, commending the *Star*, Community Health Services, and the Central Ohio Rapid Treatment Center for this special project.

The series started on November 15, 1947, and concluded on May 8, 1948.

During the period these articles were appearing, the *Star* showed a circulation increase of about 10,000. It would be unfair and illogical to claim that the venereal disease series was responsible

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<sup>2</sup> Executive Director, Community Health Services.



Figure 1.—Reproductions of actual clippings from the Columbus [Ohio] Star.



or this increase, but officials of the *Star* stated that, in their opinion, the venereal disease series was a large contributing factor. They received many letters of praise and not one letter of criticism of the series.

The stories were written by Community Health Services and screened by the staff of the Rapid Treatment Center. Each story was complete in itself, telling the history of individuals or groups of persons who had become infected with syphilis or gonorrhea and how they eventually came to treatment. No attempt was made to moralize. Medical information was made an integral part of each story.

Each case history was selected to illustrate a particular point in the venereal disease control program. A few sample headlines will illustrate this (see fig. 1). "Local Boy Spreads Syphilis" showed a trail of infections and the epidemiology of the disease. "Schoolgirl, 14, Infects 12 Youths" told of juvenile delinquency and the need for sex education. "Speed Vital in VD Treatment" emphasized the excellent chance for cure in early cases. "Syphilis Transmitted by Kiss" pointed to the dangers of promiscuity. "Dumb Doras Spreading Disease" was aimed at the socially irresponsible. "Mother Brings 8 Children to Clinic" struck at the needless tragedy of congenital syphilis. "Third Stage Ends in Paresis" stressed the folly of not completing treatment.

Actual names of patients were not used, of course, and some poetic license was permitted in the writing, but each story was based on an actual case. Locations and minor details were altered to protect the patients.

Accompanying each case history was a separate statement about venereal disease, signed by the medical officer in charge of the Central Ohio Rapid Treatment Center. These factual statements were set apart from the rest of the story by using different type, and consisted of formal comments about the disease, usually applying to the case discussed in the story. It was felt that the medical discussions added dignity and authority to the series as well as offering further education. The case stories averaged 1,000

words, and the statements were about 150 words in length.<sup>3</sup>

Each story with its illustration practically filled one of the tabloid-sized pages in the *Star*. These were well placed, invariably in the first third of the paper. More than half the series were featured with banner headlines on cover pages.

With the appearance of the first article, letters began arriving at the Rapid Treatment Center requesting additional information. Frequently diagnosis and treatment were requested. A number of persons came directly to the Center, seeking treatment, despite the fact that the articles advised them to see their private physicians or their local health officers.

A sidelight on the effectiveness of the articles concerns two soldiers. One of these men, while on furlough, had a short stop in Columbus and bought a *Star* in the railroad station. He read the article on venereal disease and later showed it to his buddy back at camp in Mississippi. Several weeks afterward, the buddy visited the Central Ohio Rapid Treatment Center while he was on a furlough. He said he had been treated for syphilis by Army physicians, but he wanted assurance from the Rapid Treatment Center that he was all right.

Patients admitted to the Rapid Treatment Center often credited the *Star* articles with spurring them to seek examination. A number of health commissioners from different parts of Ohio related anecdotes about patients arriving at clinics with a *Star* clipping in hand.

O. M. Goodloe, M. D., Columbus Health Commissioner, said attendance at the Columbus Venereal Disease Clinic was tremendously increased. Frank A. Riebel, M. D., Editor of the *Bulletin of the Columbus Academy of Medicine*, said he knew of many instances in which patients had gone to private physicians because of the *Star* series. He said further that he had heard no objection to the series from any private physician. The *Medical Academy Bulletin* carried an article praising the series.

<sup>3</sup> Reproductions of certain articles in this series will be available from the Venereal Disease Division, U. S. Public Health Service, Washington 25, D. C.



On one occasion, two sisters rushed into the Columbus clinic a day after reading a *Star* story about syphilis as a cause of falling hair. They told about a third sister whose hair was coming out in "gobs" and asked that a health officer get in touch with her. A case worker brought this sister to the clinic for examination. She and her husband were found to have syphilis.

Interviewers at the Rapid Treatment Center reported such remarks from patients as this: "Why haven't papers printed this sort of thing before? If I had read articles like that, you can bet your life I wouldn't be here today. I've saved all the articles and I'm going to show them to my friends."

A Negro woman said, "I can't read, but my husband reads right smart. He read to me all the pieces in the paper about this disease. He said I better have a blood test because I had so many babies born dead, just like it said in the paper."

On one treacherous, icy day in December, two boys drove from Newark, Ohio, to the Rapid Treatment Center in Columbus. Said one, "I brought my friend here to the doctor. I think he needs an examination. He has a sore. I read about those sores in a *Star* paper yesterday. Will you examine me, too? I've been out with the same girl."

It was obvious by this time that the newspaper series was doing a big job. We realized that there might eventually be need for some form of tabular results. Knowing that complete statistics on such a project would be impossible to obtain, we compromised on what reliable information we could get.

Interviewers questioned a series of 300 unselected cases in sequence admitted to the Central Ohio Rapid Treatment Center. Each person was asked whether he had read or heard about the articles in the *Star*. Each was asked whether these articles had influenced his decision to seek examination and treatment. The 300 were asked other questions which might prove of value in analysis.

Of the 300, who came from all parts of Ohio, 94 (31 percent) claimed to be regular readers of the *Star*, and 90 more (30 percent) said they had read at least

one of the *Star* articles on venereal disease. Out of the 184 (61 percent) who had read the *Star* articles, 58 (32 percent) stated that these articles were solely responsible for their decision to seek treatment (table 1).

**Table 1.—Reader status of 300 infected persons interviewed**

	Number	Percent of total interviewed	Percent of total readers of <i>Star</i> article
Total persons interviewed-----	300	100	
Total persons who had read one or more articles in the " <i>Star</i> "-----	184	61	100
Regular " <i>Star</i> " readers-----	94	31	
Persons who had read at least one venereal disease article-----	90	30	
Persons giving these articles entire credit for their seeking treatment-----	58		

Analyzing the 58 who came to the Center solely as a result of the newspaper publicity, it was found that a total of 38 (62 percent) had primary, secondary, or early latent syphilis, and 22 (38 percent) were suffering from late latent or other syphilis (table 2). From this it would appear that the articles, beyond their educational value, were serving as a good case-finding medium, bringing in patients at a stage when the danger of infection was greatest and when hope of cure was also greatest (table 2).

It was discovered also that 32 of this 58 (or 55 percent) had received no previous treatment, but that 26 (or 45 percent) had received some treatment. So the articles apparently were persuading lapsed patients to complete adequate treatment (table 3).

Another interesting fact was that private physicians had referred 38 (or 62 percent) of these 58 to the Rapid Treatment Center. Health departments had referred 20 (or 34 percent). The articles had advised readers to go either to their family physician or to their local health department (table 4).

Table 2.—*Syphilis diagnosis of those who gave "Star" article as reason for coming to treatment*

	Number	Percent
All cases.....	58	100
Primary and secondary.....	22	38
Early latent.....	14	24
Late, late latent, and other.....	22	38

Table 3.—*Treatment status of those who gave "Star" article as reason for coming to treatment*

	Number	Percent
All cases.....	58	100
No previous treatment.....	32	55
Previous treatment.....	26	45

Table 4.—*Referral source of patients who gave "Star" article as reason for coming to treatment*

	Number	Percent
All cases.....	58	100
Private physicians.....	38	66
Health departments.....	20	34

Of the total 300 patients interviewed, 50 percent fell into the age group between 20 and 30. There were proportionately more males than females as compared to all persons interviewed who gave the *Star* series as reason for coming to diagnosis (table 5). Also there were relatively more white persons giving the *Star* as the reason for seeking treatment. Table 5 also shows the details of sex, color, and marital status data on these 300 patients. The 300 came from 99 different communities in Ohio—136 from cities, 95 from small towns, and 69 from rural areas. It is worthy of note that more than half of these patients came from small towns or farm sections. In a further attempt to check the pulling power of the newspaper series, an offer was made to mail free literature on venereal diseases to anyone who would

write for it. A liberal supply of educational material was obtained through the cooperation of the United States Public Health Service. Readers were advised to write to the *Star*, rather than the Rapid Treatment Center or the Columbus Health Department, in the belief that they might hesitate to write to an official health agency.

The offer of free literature appeared first with the twelfth article in the series and continued through the twenty-third.

Some of the offers of literature specified special booklets for expectant mothers, teen-agers, or others. The rest of the offers concerned venereal disease literature in general.

The *Star* began receiving requests for this literature the day after the first offer appeared. The requests are still being received at the date of this writing, two months after publication ended.

In 10 weeks, requests were received from 81 of the 88 counties in Ohio. A great hunger for health information was evidenced in the rural areas and small towns, where health education facilities are meager.

No squeamishness or false modesty was seen in the requests. Housewives in

Table 5.—*Comparison of data on all persons interviewed with persons who gave "Star" article as reason for coming to treatment*

Data	All persons interviewed		Persons giving "Star" as reason for coming to treatment	
	Number	Percent	Number	Percent
All cases.....	300	100	58	100
By sex:				
Males.....	139	46	33	57
Females.....	161	54	25	43
By color:				
White.....	213	71	52	90
Nonwhite.....	87	29	6	10
By marital status:				
Married.....	134	45	28	48
Widowed.....	2	1	2	4
Single.....	107	35	15	26
Divorced or separated.....	57	19	13	22

small towns would ask for extra copies, which they promised to distribute to friends and particularly to young people. Several ministers requested copies for group reading to their parishioners. Two Girl Scout troops wanted teen-age booklets. There were requests from several trade unions, from servicemen, from an industrial nurse, from the head of a police morals squad, from college students writing term papers, from boys' clubs, from high school hygiene classes, from a bartender who promised distribution at his place of business.

It was surprising that lawyers, nurses, school teachers, and police officials seemed not to have known such material was easily available.

It was encouraging that many parents wanted venereal disease literature for their children.

There were more than 1,000 requests in the first 10 weeks and 8,000 pieces of literature were distributed. In addition to mail originating in Ohio, there were requests from 22 cities outside Ohio, in Illinois, Indiana, Kentucky, Mississippi, New Jersey, North Carolina, Pennsylvania, Virginia, and West Virginia. The *Star* does not circulate outside Ohio. The out-of-State mail is believed to be the result of copies sold in railroad stations, bus stations, and hotels.

Indication of a need may have been deduced by the fact that the greatest number of specific requests—313 letters—were for the booklet, *Solid Facts for Teen-Agers*. Many of these letters obviously were sent by youngsters themselves. It was interesting that a large

number of parents wanted not only literature on venereal disease, but also literature on sex education in general.

Curiously enough, when the comic booklets, *Little Willie* and *Doc Carter*, were offered, 182 individuals wrote, requesting this type of literature specifically. These books were designed originally for use in the South, but indications are they can be used valuably in northern areas, too.

The Rapid Treatment Center also received 51 letters requesting consultation and advice on personal problems. It is noteworthy that these persons, in the face of possible social stigma, wrote blindly to someone they didn't know, admitting they had one or more of the venereal diseases. It indicates that the newspaper series engendered confidence in the Rapid Treatment Center.

It is our belief, based on newspaper evaluation of mail received, that nearly all of the 90,000 to 100,000 regular purchasers of the *Columbus Star* read at least one of the articles on venereal disease. Since two or three persons read each newspaper, it is quite possible that several hundred thousand persons were reached with some amount of venereal disease information.

In summary, we believe that a worthwhile experiment in mass public health education has been demonstrated; that a newspaper series of case histories, written entertainingly but with a careful background of scientific fact, can serve as an effective case-finding medium as well as an educational project; that such a series, properly written, will be welcomed by newspapers anywhere.



# A Macroflocculation Test for Syphilis Using Cardiolipin-Lecithin Antigen

## Preliminary Report<sup>1</sup>

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Since cardiolipin (1, 2, 3) and purified lecithin have been found to be satisfactory antigen components in complement-fixation (4, 5, 6) and flocculation tests (7, 8, 9, 10, 11, 12) for syphilis an investigation has been conducted into the use of a single antigen for both slide and tube type flocculation test procedures. A microflocculation test, designated as the VDRL slide flocculation test has been the subject of previous reports (13, 14). The purpose of this report is to describe a tube—macroflocculation procedure that utilizes the same reagents used in the VDRL slide flocculation test. The test herein described will be referred to as the VDRL tube flocculation test.

Inasmuch as results produced by any testing method are a reflection not of reagent reactivity alone but rather of the combined effects of antigen and all phases of the technic, it was necessary to design a testing procedure that would produce optimal results with an antigen presently used in a method set at an acceptable level of reactivity. The VDRL slide test had been established at a level of reactivity within the limits set by other tests of standard reactivity (12). Therefore an effort was made to reproduce this reactivity level as closely as possible with the tube-testing procedure.

In addition to the primary requirement that reagents for the slide test be used in the tube test, it also seemed desirable that

the same antigen suspension serve for both testing procedures. Reproducibility of results could in this way be enhanced, since the antigen suspension for the VDRL slide test is maximally reactive from the time it is prepared, and remains at this reactivity level during the working day.

The mechanics of tube test procedures have included either shaking or centrifuging or both. Since centrifuging can cause visible clumping of sensitized antigen particles, not macroscopically discernible after a shaking period, the combination of shaking and centrifuging was selected for this test.

In the selection of a suitable method for reporting test results several factors were considered. Primary among these was the inherent lack of reproducibility associated with a procedure when several different terms or symbols are used to describe degrees of reactivity in a qualitative test. When numerical terms are used for reporting the results of qualitative procedures, slight changes from one number to the next, such as from 1+ to 2+ or from 3+ to 4+, may connote a change in serum reactivity although these differences lie within the limits of technical deviation. For these reasons only the terms "positive" and "negative" were selected for the reporting of results obtained with the qualitative VDRL tube flocculation test.

Quantitative findings are recorded as reactivity in the highest serum dilution producing a positive reaction, i. e., positive at 1:16 dilution or 16 dils (15).

<sup>1</sup> From the Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island 4, N. Y. Medical Director J. F. Mahoney in charge.

## Method

### The VDRL Tube Flocculation Test<sup>2</sup>

#### Qualitative Test

1. Prepare antigen emulsion as described for the VDRL slide flocculation test.<sup>2</sup>

2. Add four parts of 1-percent sodium chloride solution to one part of VDRL slide test emulsion. Mix well and allow to stand five or more minutes (not longer than 2 hours) before use. This solution will be referred to as diluted antigen emulsion.

3. Heat serums at 56° C. for 30 minutes or at 60° to 62° C. for 3 minutes.

4. Pipette 0.5 ml. heated serum into a 12 x 75 mm. (O. D.) test tube.

5. Add 0.5 ml. diluted antigen emulsion to each serum.

6. Shake tubes on Kahn shaker for 5 minutes.

7. Centrifuge all tubes for 10 minutes at force equivalent to 2,000 r. p. m. in No. 1 I. E. C.<sup>3</sup> or 1,700 r. p. m. in No. 2 I. E. C.<sup>3</sup> centrifuge.

8. Return tubes to the Kahn shaking machine and shake for exactly 1 minute.

9. Read reactions, as soon as secondary shaking period is completed, by holding tubes close to the shade of a reading lamp, with a black background, at approximately eye level. A shaded fluorescent desk lamp or a gooseneck-type lamp, with a blue inside-frosted daylight bulb, are satisfactory reading light sources.

10. Record results as follows:

(a) *Positive*.—Visible aggregates in a clear or slightly turbid medium. All borderline reactions, where the observer has doubt regarding visible clumping, should be reported as negative.

(b) *Negative*.—No visible clumping or aggregation of antigen particles. Appearance slightly turbid or granular. Definite silken swirl on gentle shaking.

[*Note*.—Turbid or hemolyzed serums may cause completed tests to be too turbid for macroscopic reading. Fluid from these tubes may be examined microscopically. Positive reports may be rendered when large antigen-particle masses are detected microscopically provided the serum tested is found to be free of individual antigen particles at the same magnification.]

Zonal reactions, due to excess of reactive serum component, may appear to be very weak or in rare instances negative. Whenever a zonal reaction is suspected, another test should be performed using 0.1 ml. of heated serum and 0.4 ml. saline in place of the original 0.5 ml. serum. If a positive result is obtained with the smaller amount of serum, a positive report should be issued.

#### Quantitative Test

Quantitative tests are performed on serum serially diluted in saline, each dilution of which is treated as an individual serum and tested as described under "Qualitative Test." Freshly prepared 0.9-percent saline is used for these dilutions. Serum dilutions are prepared by placing 0.5 ml. saline in each of six or more test tubes. Add 0.5 ml. of heated serum to test tube 1, mix well and transfer 0.5 ml. to tube 2. This operation is continued until the sixth or last tube contains 1.0 ml. Discard 0.5 ml. from last tube. Serum dilutions of 1:2, 1:4, 1:8, 1:16, etc. are thereby obtained.

Each serum dilution is tested and the greatest dilution producing a definitely "Positive" reaction is reported as the reactivity endpoint in accordance with the following example:

<sup>2</sup> Detailed copies of technic for the VDRL slide and tube flocculation tests can be obtained from the Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island 4, New York, N. Y.

<sup>3</sup> International Equipment Co., Boston, Mass.

1:2    1:4    1:8    1:16    1:32    1:64

P    P    P    P    N    N    Positive, 1:16 dilution or 16 dils (15).  
 P    P    N    N    N    N    Positive, 1:4 dilution or 4 dils (15).  
 N    N    N    N    N    N    Positive<sup>1</sup> undiluted only or 1 dil (15).

<sup>1</sup> Positive reaction obtained with undiluted serum.

The VDRL tube and slide flocculation tests were performed in parallel on blood specimens from syphilitic patients taken before, during, and after treatment, and from presumably nonsyphilitic donors. The results of these tests are presented in table 1.

**Table 1.—Comparison of results obtained with the VDRL slide and tube flocculation tests**

AGREEMENT

VDRL slide test	VDRL tube test	Number specimens
Positive.....	Positive.....	1,821
Weakly positive.....	Positive.....	494
Negative.....	Negative.....	2,630
Total.....		4,945
Agreement.....percent..		98.59

DISAGREEMENT

Positive.....	Negative.....	2
Weakly positive.....	Negative.....	42
Negative.....	Positive.....	27
Total.....		71
Disagreement.....percent..		1.41

These findings indicate that the VDRL tube test will operate at a reactivity level approximating that of the VDRL slide flocculation test.

### Discussion

The tube test herein described is offered not as a substitute for the VDRL slide flocculation test but rather as a companion test for this procedure. Although a slide test is more rapidly performed, some laboratories are dedicated to the use of a tube-testing method through long periods of experience with the equipment and means for conducting one or more serologic tests in test tubes. The VDRL tube flocculation test was formulated to

meet this need with a test employing previously standardized reagents.

Antigen for this test is assembled from cardiolipin, purified lecithin, cholesterol and alcohol of designated purities. Standardization of this antigen is accomplished by adjustment of the lecithin content. Cardiolipin and cholesterol content of this reagent are maintained at 0.03 percent and 0.9 percent respectively.

Purified lecithins prepared in this laboratory and obtained from other sources have had variable capacities as antigen sensitizers. To reproduce antigen of constant serologic reactivity it has recently been necessary to use concentrations of lecithin between the extremes of 0.20 percent to 0.27 percent as calculated from gravimetric equivalents based on phosphorus determinations. For this reason the lecithin content of an antigen for this test must be determined by serologic assay.

### Summary

1. A brief description of the VDRL tube flocculation test is presented.
2. Results obtained with the VDRL tube and slide tests on 5,016 serums are analyzed for agreement and disagreement.

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## CURRENT LITERATURE

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of articles concerned with venereal diseases or related subjects which have been published in the better-known journals during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

### ACTA OBST. ET GYNEC. SCANDINAV., STOCKHOLM

Results of gonococcus cultivation from a gynecological patient material. Jens L. Hansen. 25: 18-31, Fasc. I.

### AM. J. CLIN. PATH., BALTIMORE

Effect of lipids on Kahn antigen. III. Increasing sensitivity of Kahn standard antigen to the level of Kahn sensitized antigen by addition of alcoholic extract of soy bean lecithin. Albert H. Wheeler and Ella M. Brandon. 17: 770-776, Oct. 1947.

Cardiolipin lecithin antigen. B. S. Kline. Editorials. 17: 874-878, Nov. 1947.

Verification antigen for the identification of pseudosyphilitic reactions of serum, Hugo Hecht. 17: 949-954, Dec. 1947.

### AM. J. DIS. CHILD., CHICAGO

Gonococcal vaginitis in children treated with a single injection of penicillin in beeswax and peanut oil. Report of twenty cases. B. G. Clarke and H. H. Eisenberg. 74: 707-710, Dec. 1947.

### AM. J. M. SC., PHILADELPHIA

Some problems in the biology of the syphilitic infection. John H. Stokes and Herman Beerman. 215: 461-469, Apr. 1948.

### AM. J. M. TECHNOL., LAFAYETTE

Penicillin and streptomycin sensitivity of miscellaneous bacteria and fungi. Lida H. Mattman. 13: 159-168, July 1947.

### AM. J. NURSING, MOUNT MORRIS

One hundred fifty years of service. [Public health nursing.] 48: 434-435, July 1948.

Morphologic changes in syphilitic lesions during the Herxheimer reaction. Walter H. Sheldon and Albert Heyman. [Scientific Proceedings of the American Association of Pathologists and Bacteriologists, Forty-fifth Annual Meeting, Philadelphia, Mar. 12-13, 1948.] 24: 727, May 1948.

\*Bismuth plus penicillin in the treatment of experimental syphilis. Harold J. Magnuson and Barbara J. Rosenau. 32: 203-211, May 1948.

\*Penicillin versus penicillin-malaria in the treatment of dementia paralytica. Y. T. Wong and Henry Packer. 32: 212-223, May 1948.

\*The serologic response in penicillin-treated symptomatic neurosyphilis. John P. Scully, Mortimer S. Falk and John H. Stokes. 32: 224-232, May 1948.

\*Treatment-failures following the use of penicillin in late syphilis. Frank W. Reynolds. 32: 233-242, May 1948.

Gummatous osteomyelitis with pathologic fracture complicating general paresis. A report of three cases. Edwin G. Olmstead. 32: 243-250, May 1948.

Electrophoretic analysis of serum from patients with pinta and yaws. M. L. Dillon and G. R. Cooper. 32: 251-255, May 1948.

Venereal disease in prostitutes. Theodore Rosenthal and George Kerchner. 32: 256-264, May 1948.

\*Alleged penicillin-resistant gonorrhea. Raymond P. Hughes and Charles M. Carpenter. 32: 265-271, May 1948.

The value of roentgenography of the male urethra following infection. M. Leopold Brodny and Samuel A. Robins. 32: 272-285, May 1948.

Simultaneous herpes zoster and lymphogranuloma venereum. Lytt Gardner. 32: 286-288, May 1948.

Virulence and antigenicity of *Hemophilus ducreyi*. R. B. Dienst. 32: 289-291, May 1948.

Tenth annual session, American Venereal Disease Association. Announcement. 32: 300, May 1948.

**Bismuth plus penicillin in the treatment of experimental syphilis.** Harold J. Magnuson and Barbara J. Rosenau. Am. J. Syph., Gonor. & Ven. Dis., 32: 203-211, 1948.

In this report, the authors show that bismuth and penicillin are synergistic in

the treatment of experimental syphilis, the optimum effect being obtainable when the bismuth, in soluble form, acts simultaneously with the penicillin.

Rabbits weighing between 2.5 and 3.5 kg. were inoculated intratesticularly with *Treponema pallidum*; 6 weeks later, after confirmation of infection by dark-field examination, the animals were treated by one of six schedules described by the authors. Twenty penicillin injections were administered intramuscularly into the thighs over a period of 4 days, and bismuth was given in subcurative doses. The penicillin contained 35 percent G, 35 percent K, and 30 percent F, diluted so that the unit dose was contained in from  $\frac{1}{4}$  to 1 cc. per kilogram of body weight; the bismuth subsalicylate was diluted in peanut oil to contain 5 mg. of metallic bismuth per cubic centimeter; and the bismuth and potassium tartrate was diluted to give a concentration of 2.2 mg. of metallic bismuth per cubic centimeter, all bismuth injections being given into the lumbar muscles.

Node transfers, as tests of cure, were performed 6 months after treatment by inoculating the testes of normal rabbits with the node emulsion. If testicular emulsions from these rabbits were dark-field negative at 3 months, the original animals were considered cured.

The results of treatment show that the  $CD_{50}$  of penicillin alone was 2,650 units per kilogram and the  $CD_{90}$ , 8,000 units per kilogram. The addition of one-fourth of the  $CD_{50}$  of bismuth subsalicylate (1.4 mg. of metallic bismuth per kilogram) at the beginning of penicillin therapy reduced the  $CD_{50}$  to 1,000 units per kilogram and the  $CD_{90}$  to 1,800 units per kilogram. When this dose of bismuth subsalicylate was given at the completion of penicillin therapy, so that the drugs did not act simultaneously, the  $CD_{50}$  was reduced to 1,500 units per kilogram and the  $CD_{90}$  to 3,300 units per kilogram. When the same fraction of the  $CD_{50}$  of bismuth and potassium tartrate was substituted for the bismuth subsalicylate, the  $CD_{50}$  of penicillin dropped to 500 units per kilogram and the  $CD_{90}$  to 1,300 units per kilogram, due to the

rapid absorption of the soluble salt providing a maximum simultaneous action of the two drugs. Increase of the dose of bismuth subsalicylate to three-fourths of the CD<sub>50</sub> (4.2 mg. of bismuth per kilogram), either at the start or immediately following penicillin therapy, reduced the CD<sub>50</sub> of penicillin to approximately 110 units per kilogram and the CD<sub>90</sub> to approximately 250 units per kilogram.

The authors, in comparing data from this study with Eagle's data on mapharsen, found bismuth and penicillin to be as synergistic in the treatment of early rabbit syphilis as mapharsen and penicillin, and it is therefore recommended that when combined heavy metal-penicillin therapy is employed in human syphilis, bismuth is to replace mapharsen, with the bismuth administered in soluble form during the penicillin phase of the therapy, if optimum results are to be obtained.

#### **Penicillin versus penicillin-malaria in the treatment of dementia paralytica.**

Y. T. Wong and Henry Packer. *Am. J. Syph., Gonorr. & Ven. Dis.*, 32: 212-223, 1948.

The authors report on a group of 46 patients with dementia paralytica or dementia paralytica with tabes treated at the Gailor [Memorial] Psychiatric Hospital [Memphis, Tenn.].

The patients were divided into two groups with essentially similar psychoses; one group received penicillin alone while the other received penicillin plus malaria. The average duration of symptoms of neurosyphilis in the two groups was 17.5 and 16.5 months, respectively. Spinal fluid, obtained by lumbar puncture, was examined before and after treatment and at intervals of 3 months thereafter. The Kolmer complement-fixation test was employed in blood serologic studies, and colloidal gold tests were performed by standard procedure. Fever was measured by the number of hours above 103° F. (rectal) based on temperature readings taken every 30 minutes during each paroxysm. The average amount of fever received by the penicillin-malaria group was 35 hours. Peni-

cillin was administered intramuscularly as the sodium salt in isotonic saline solution in doses of 30,000 units every 3 hours day and night, the penicillin and the penicillin-malaria groups receiving an average of 5.99 and 5.74 million units, respectively, over a period of 21.8 days for both treatment groups.

An analysis of the data shows the following results: (1) Mean cell counts at the end of treatment and after 3 and 6 months were identical for both groups; at the end of 6 months, 83 percent of the penicillin group and 86 percent of the penicillin-malaria group achieved cell counts of 4 or less (considered normal); (2) mean protein values for the penicillin and penicillin-malaria groups at the end of 6 months were 47 and 48 mg. per 100 cc. spinal fluid, respectively; (3) no patient in either treatment group manifested a normal colloidal gold test at the end of 6 months, indicating a much slower return to normal than in the case of spinal fluid cell counts or protein; (4) changes observed in spinal fluid Kolmer titers showed a slow steady upward trend in the mean quantity of spinal fluid required to give 3- to 4-plus reactions over the period of observation; at the end of 6 months, 72 percent of the penicillin group and 71 percent of the penicillin-malaria group gave such reactions in 0.125 cc. or less of spinal fluid; (5) while the mean titer of the blood Kolmer test for the penicillin group was considerably higher at the outset, both groups showed a steady decline in titer during the 6-month period following treatment, with reductions in titer to 57 and 49.2 percent, respectively, of the original titers. The reductions in the spinal fluid titers for the two groups, 54.7 and 48.5 percent, respectively, of the original titers were seen to parallel closely the reductions observed in the blood titers. The proportion of patients achieving 50 percent or more clinical improvement was not significantly different in the penicillin and penicillin-malaria groups (74 and 78 percent, respectively), and relapses, which occurred between 6 and 12 months following completion of treatment, were observed only in pa-



ients receiving 3.6 million units or less of penicillin.

In this study, no significant advantages were evident in the improvement in spinal fluids, blood serologic tests, or clinical manifestations with the addition of malaria therapy to the penicillin regimen, response in the two groups being essentially equivalent. It is therefore recommended by the authors that additional studies of this type be made to determine further the value of malaria in the treatment of neurosyphilis.

**The serologic response in penicillin-treated symptomatic neurosyphilis.** John P. Scully, Mortimer S. Falk and John H. Stokes. *Am. J. Syph., Gonorr. & Ven. Dis.*, 32: 224-232, 1948.

The authors analyze serologic follow-up in 213 patients with late symptomatic neurosyphilis treated with various dosages of penicillin, in order to determine whether penicillin in late neurosyphilis is more effective than other forms of therapy in reducing the blood serologic tests for syphilis and whether a correlation exists between the clinical and blood serologic response.

During periods of follow-up from 6 months to over 2 years, there was seen less than a 10-percent chance for complete serologic reversal in late symptomatic neurosyphilis; for instance, in 58 patients followed from 6 months to 1 year, only 4 (6.9 percent) of the serologic tests reversed to negative, and in 106 patients followed from 1 to 2 years, only 8 (7.5 percent) of the serologic tests so reversed. While less than one-fourth of the patients in this study, most of whom had tabes dorsalis, maintained a negative serologic test for syphilis throughout the period of observation, no patient originally negative subsequently developed a positive blood serologic test for syphilis. It was also seen that an increase in the amount of penicillin or a repetition of the course within 3 months to 1 year did not materially affect the percentage of serologic reversals in a 6-month to 2-year period of observation.

The fact that little correlation existed between the spinal fluid response and se-

rologic response in all diagnostic categories, including general paresis, taboparesis, tabes dorsalis, and meningovascular neurosyphilis, was statistically proved by the Chi-square test for association. Actually, the number of patients whose blood serologic tests became more positive in accompaniment with normal or near-normal spinal fluids was greater than the number reversing to negative. The data indicate that there is no more than a 15-percent chance of blood serologic improvement (including reversal to negative) in patients attaining normal or near-normal spinal fluids.

In every patient of an unselected group of 15 originally positive individuals followed from 500 to over 1,000 days, fluctuations in serologic titer were noted which ranged from doubtful to 128 Kline units and which were apparently independent of either cerebrospinal fluid or clinical trends. It is emphasized that in view of such fluctuations in titer, no single serologic test should be used as a basis for prognostic conclusions.

It was therefore shown in this study that no correlation exists between cerebrospinal fluid and blood serologic response, and it would appear that penicillin adds nothing to our armamentarium for reversing the positive blood serologic test to negative in late symptomatic neurosyphilis.

**Treatment-failures following the use of penicillin in late syphilis.** Frank W. Reynolds. *Am. J. Syph., Gonorr. & Ven. Dis.*, 32: 233-242, 1948.

The possibility is pointed out that penicillin ultimately may prove less efficacious against *Treponema pallidum* in the later stages of syphilitic infection than during the more acute early phase of the disease. In early syphilis, failure rates approximately 18 months following penicillin therapy have ranged from 5 to 30 percent, being significantly higher than those with adequate metal chemotherapy.

The author discusses treatment failures observed among 550 patients with late syphilis treated with penicillin at the Medical Clinic of the Johns Hopkins Hospital as due to the following causes:

1. *Penicillin resistance*.—From this clinic a patient was reported with gumma of the penis, the diagnosis of which was substantiated by evidence of syphilis of at least 10 years' duration, destructive nature of the lesion, repeatedly negative dark-field examinations and smears for Donovan bodies, and persistently high serologic titer. Although the lesion failed to heal after 4,800,000 units of penicillin, complete response was obtained with mapharsen and bismuth therapy.

2. *Clinical progression despite penicillin therapy*.—Of 82 patients with late asymptomatic neurosyphilis treated with penicillin alone and followed for a minimum of 6 months, 6 have been re-treated with malaria, usually with additional penicillin. One case history is detailed in which symptoms disappeared completely. Among 24 patients with general paresis, however, there were 6 whose parietic psychoses became worse following therapy with penicillin alone; of these 6, 1 died and the others were committed to mental hospitals. Only 9 of 33 patients with tabes dorsalis were benefited from penicillin alone, while 18 were unchanged and 6 were worse. Ataxia, urinary symptoms, and sensory disturbances frequently became more severe following therapy, it is noted. Penicillin alone was found of little value in primary optic atrophy and of no value in Erb's spastic paraplegia.

3. *Recurrence of late lesions following penicillin*.—One case is detailed in which relapsing osseous lesions and a serpiginous syphilide developed following penicillin therapy, while another patient was seen who twice had reactivation of a cutaneous gumma.

4. *Development of new lesions following penicillin*.—The patient discussed was treated originally for late unclassified neurosyphilis with apparently favorable results, but 16 months following a course of 8,000,000 units of penicillin, evidences of cardiovascular syphilis with aortic regurgitation developed.

In view of the failures to penicillin therapy alone in late syphilis demonstrated in this study, the author emphasizes the necessity of caution in the use of the drug in this complication.

**Alleged penicillin-resistant gonorrhea**  
Raymond P. Hughes and Charles M. Carpenter. *Am. J. Syph., Gonorr. & Ven. Dis.* 32: 265-271, 1948.

The authors present a study of 216 soldiers with alleged penicillin-resistant gonorrhea, evacuated from the Pacific Theater to the Zone of Interior, who had been hospitalized from 2 to 6 months for treatment with intramuscular injections of several million units of aqueous penicillin without cure of their urethritis. On arrival in the United States, these patients were placed under strict quarantine in an Army General Hospital, and clinical and bacteriologic procedures described by the authors were carried out.

Clinical examination showed 86 (40 percent) of the 216 men to be asymptomatic, whereas the remainder presented such various symptoms as urethral exudate, burning on urination, epididymitis, and enlarged indurated inguinal lymph nodes. *Treponema pallidum* was demonstrated in penile ulcers of two of the men with urethritis. Bacteriologic examination revealed only 19 patients (9 percent) to be infected with the gonococcus; of the remaining 111 men, 93 had nongonococcal urethritis and 18 had other forms of disease of the genitourinary tract.

Fourteen of the nineteen patients with gonococcal infection were treated with a single injection of 300,000 units of calcium penicillin in peanut oil and beeswax and responded promptly to treatment, with disappearance of the urethral exudate in 24 to 72 hours after therapy. The five remaining patients, who received 300,000 units of crystalline penicillin G in peanut oil and beeswax, showed little clinical improvement in 24 hours, but on re-treatment with 300,000 units of calcium penicillin in peanut oil and beeswax, the urethral exudate disappeared rapidly and the patients were asymptomatic in 48 hours. Tests for cure, which consisted of three consecutive negative films and cultures made at 24-hour intervals following subsidence of symptoms, revealed no evidence of gonococcal infection.

The alleged penicillin resistance of the patients in this study was found to be

a result of the erroneous diagnosis of non-gonococcal urethritis as chronic gonococcal urethritis through faulty Gram stains carried out by poorly trained technicians with a limited knowledge of bacteriology, and to reinfection of the patients during hospitalization or while on leave during treatment. The importance of correct laboratory technic and the control of reinfection in cases of penicillin-resistant gonorrhea is therefore emphasized by the authors.

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# **CURRENT NOTES AND REPORTS**

## **District of Columbia Gonorrhea Campaign**

Washington, D. C., having the second highest gonorrhea prevalence rate among the cities of the United States, has undertaken an intensive 1-year program aimed at controlling the disease in the Nation's capital. Keystone in the program structure is meaningful public appeal and private physician cooperation.

The District of Columbia Health Department has established some landmarks in venereal disease publicity. Therefore, it has succeeded in placing the facts about gonorrhea in just about all mediums of public communication—not once, but repeatedly.

Plans for the project were first drafted in April 1948, after the District of Columbia Health officials had decided that gonorrhea was getting out of hand. Only New York, Chicago, and Memphis lead the District of Columbia in the number of cases of gonorrhea reported.

The kick-off was on July 18, 1948, with a half-hour dramatic radio show entitled "The Force of Ignorance" on radio station WOOK. The program, using the time allotted to the Institute of Race Relations, employed local amateur talent.

A few hours later, "The District Roundtable," the program of the National Association of Broadcasters and the District of Columbia Junior Bar Association, featured a gonorrhea symposium. Speakers

were: Dr. Orris Robinson, chairman of the Board of Social Welfare, Washington Federation of Churches; Mr. Joseph Sanders, member of the board of the District of Columbia Social Hygiene Association; and Dr. S. Ross Taggart, chief, Bureau of Venereal Diseases, District of Columbia Health Department.

Beginning on July 19, 7 local radio stations began broadcasting spot announcements, varying in length from 15 to 60 seconds, pointing up some of the symptoms of gonorrhea, possible sequelae, and the simplicity of treatment with penicillin. By prearrangement, the announcements were given at specific times and on specific programs where it was thought that they would reach a suitable radio audience. The 7 stations played an average of 4 announcements each, or 28 a day, during the first week.

On August 1, another type of radio program was presented. Station WTOP took a tape recorder to a gonorrhea clinic and interviewed some of the patients. In a bid for feminine appeal, the patients interviewed were women. Their reactions to the diagnosis of gonorrhea were recorded. Dr. Clifford E. Bagley, chairman of the Venereal Disease Committee of the Medical Society of the District of Columbia, described the symptoms of gonorrhea to the patients and to the radio audience.

"The District Roundtable" and "The Force of Ignorance" have been rebroadcast on other stations. Station WINX has offered as much time as is desired; probably four to six programs will be produced on this station during the year.

The backbone of the radio education program will be the weekly series of 15-minute shows on WWDC, planned to continue throughout the gonorrhea campaign.

The television audience was first reached on July 21, when station WNBW publicized the gonorrhea control campaign on the "Washington Newsreel" program. This probably was the first television show dealing with gonorrhea ever to be produced.

A second television program was staged on August 16, this time on station WTTG. It was a dramatic presentation in which a Washington physician talking to a patient described the mode of transmission of gonorrhea, the cure of the disease, and the possible consequences of the failure to be treated.

A series of 8 leaflets has been prepared and distributed, more than 500,000 copies in all. They were designed to be distributed by rooming house owners, bartenders, liquor storekeepers, pharmacists, bellhops, taxicab drivers, and barbers. The eighth one was more general, aimed at wage earners, pointing out that, with living costs high, they cannot afford to be sick. The only opposition encountered was the refusal of the District of Columbia Public Utilities Commission to allow the leaflets to be placed in the taxicabs.

The other seven styles of leaflets have been distributed freely.

The Washington newspapers cooperated wholeheartedly in the public health effort. A reporter from each paper was assigned to the campaign. Numerous articles appeared in the daily papers, the Sunday magazine sections ran feature stories, and each of the daily papers ran at least one editorial.

In every form of communication with the public, the health officials urged individuals to call the Health Department for information. Those who called were given details as to the symptoms of gonorrhea, and they were advised to see their personal physicians. If a person had no physician, he was given the names of three physicians in his area who would treat him. If he was unable to afford treatment, he was referred to one of the three free clinics taking part in the drive. The Health Department has distributed free of charge to District physicians more than 2,000 disposable hypodermic syringes, each containing 300,000 units of penicillin, enough for 1 treatment. Any physician in the District could request as many of these syringes as he needed. The plan had the complete sanction of the Medical Society of the District of Columbia.

The publicity staff is working on a clip sheet, showing the results of the public relations and public education effort; this material will be distributed to the information sections of the Public Health Service District Offices. Also in preparation is a log of the methods used in obtaining public cooperation in the campaign.

## **New Syphilis Handbook Now Available**

A new handbook, entitled *Diagnosis and Treatment of Syphilis: A Handbook for Physicians*, is now available at a cost of 50 cents a copy. The book is an adaptation of the earlier volume, *Syphilis Today*, which was first issued in 1947 by the Mississippi State Board of Health.

The new book is published by the Venereal Disease Education Institute, Raleigh, N. C., in cooperation with the

Venereal Disease Division, United States Public Health Service. It contains the latest treatment schedules and information on diagnosis by stages of syphilis. It is attractive and well bound and very suitable as a reference work.

Copies may be obtained by writing to the Venereal Disease Education Institute, Raleigh, N. C.



## Venereal Disease Division Plans "Confessions" Magazine

An innovation in venereal disease educational material is *My Story* magazine, produced by and now available through the Venereal Disease Education Institute, Raleigh, N. C., with the cooperation of the Venereal Disease Division, United States Public Health Service.



The magazine, a "slick," is written in the popular confessions style. It combines information about the venereal diseases—their cause, spread, treatment, cure, and prevention—in palatable form, interesting to the nonscientifically educated reader.

*My Story* is well illustrated, with a distinctive, four-color cover. The articles are accompanied by human interest photographs, also in color. One section is a quiz, testing the reader's knowledge about the venereal diseases. A crossword puzzle tests one's familiarity with certain slang terms, such as "syph," "dose," "clap," and "strain," and at the same time familiarizes the reader with the more scientific terms.

It has been estimated that more than 5,000,000 women read this type of magazine each month. Most of these women

are from 16 to 36 years of age. This is the same age group in which most of the venereal disease infections among women occur. If these women want this type of magazine, let them have it—with venereal disease information. This idea was conceived by Mr. D. V. Liberti, Health Training Specialist in charge of the Extension and Training Section of the Venereal Disease Division. He reasoned that a popular magazine might be a very good means of reaching women in this important age group, women who might not be interested in medical pamphlets and leaflets but who would read a confessions magazine.

With this in mind, the magazine has been designed so as to stimulate the reader interest that has made the "confessions" magazines so popular. For example, there are stories entitled: "Secret Thoughts of a Nurse," "The Girl I Didn't Marry," "I Thought that I Was Smart," "My Husband Had Syphilis," and a novellette, "From the Depths of Despair." The articles and features are: "Six Steps to Health," "How Your Health Department Guards You," "Talk It Over With Your Religious Leader," "The World is Getting Smarter," (signed by movie actor Eddie Albert), "Women Talk About It Now," (signed by Helen Baylous, former Powers model), "How Many Answers Do You Know?" and the crossword puzzle. Numerous advertisements for venereal disease pamphlets, movies, leaflets, and other informational materials are included, so that, if a reader should want further information, she would know where to obtain it.

*My Story* is especially valuable in clinics and rapid treatment centers. Copies could be placed on tables in the recreation room or library. In this way, the magazine would serve a valuable function in patient education programs.

For information as to price and quantity, address Mr. Felix A. Grisette, Executive Director, Venereal Disease Education Institute, Raleigh, N. C.

## International Union Against the Venereal Diseases

The 1948 General Assembly of the International Union Against the Venereal Diseases, held in Copenhagen, Denmark, September 6-10, heard Dr. Joseph S. Spoto, Senior Surgeon, Venereal Disease Division, United States Public Health Service, speak on "The Present Status of Penicillin" and heard another talk on the venereal disease problem in one world.

On the agenda for the meeting were: Consideration of plans for the international venereal disease control program; consideration of a recommendation for cooperation with the United Nations, especially its Educational, Scientific, and Cultural Organization and the World

Health Organization; biological, physiological, and psychological aspects of human behavior, as related to the prevention and control of venereal diseases; modern methods for the treatment of syphilis; the international inquiry into transmission of venereal diseases in the Rhine River area.

The 1948 Assembly celebrated the twenty-fifth anniversary of the Union. Dr. William F. Snow, President of the Union, attended as part of the United States delegation. Further information can be obtained from Miss Jean B. Pinney, Director, Regional Office for the Americas, care of the American Social Hygiene Association, 1790 Broadway, New York 19 N. Y.

### APHA Meeting Displays Due

Educational materials of various sorts should be submitted before October 15, 1948, for inclusion in the displays at the Health Education and Publicity Headquarters at the seventy-sixth annual meeting of the American Public Health Association, in Boston, Mass., November 8-12.

This material, illustrating venereal disease case-finding programs, is being sought by the National Publicity Council for Health and Welfare Services, Inc.

Everything from single printed pieces to brochures and charts outlining complete case-finding campaigns is desired. Informational materials on the functioning of rapid treatment centers also is wanted.

All materials submitted should be addressed to the National Publicity Council, 130 East Twenty-second Street, New York 10, N. Y. Additional information may be obtained by writing to the Information Department of the Council.

### Syphilis Study Section Symposium Proceedings Now Ready

*Recent Advances in the Study of the Venereal Diseases*, the proceedings of the Syphilis Study Section Symposium held in Washington, D. C., April 8-9, 1948, is now available to all persons interested.

The book, containing about 350 pages, includes some of the latest clinical and experimental work done on the venereal diseases, including the results of therapy with procaine penicillin. It is a valuable

addition to the library of the clinician or research worker.

For information regarding other Syphilis Study Section activities, write to Frank W. Reynolds, M. D., Executive Assistant, Syphilis Study Section, National Institute of Health, Bethesda 14, Md. Information concerning cost of the proceedings may be obtained from the Venereal Disease Education Institute, Raleigh, N. C., which published the work.

# STATISTICS

## Diagnosed Cases of Syphilis and Gonorrhea Reported for the First Time in the United States and Territories, by Quarters

[Known military cases excluded]

Period	Private physicians					Gonorrhoea
	Syphilis					
	Total <sup>1</sup>	Primary or secondary	Early latent	Congenital	Late or late latent	
July-September 1942	53,412	10,148	9,936	1,399	21,533	24,130
October-December 1942	55,647	10,173	9,622	1,303	22,207	23,471
January-March 1943	49,356	9,937	9,022	1,254	20,436	20,201
April-June 1943	47,897	9,446	9,525	1,202	20,471	19,314
July-September 1943	44,304	9,038	8,946	1,130	18,844	21,733
October-December 1943	40,709	8,779	8,335	988	17,235	20,232
January-March 1944	40,903	8,624	8,983	954	17,745	18,465
April-June 1944	40,712	8,447	9,205	1,079	17,638	20,168
July-September 1944	34,990	8,065	7,729	963	14,854	21,825
October-December 1944	34,317	7,931	7,514	925	14,904	20,025
January-March 1945	35,234	8,383	8,038	953	14,689	19,553
April-June 1945	35,505	7,942	7,757	869	15,389	20,182
July-September 1945	31,029	6,919	6,905	756	13,474	22,071
October-December 1945	29,093	7,245	6,547	725	12,040	23,477
January-March 1946	34,113	8,883	7,930	886	13,720	25,965
April-June 1946	36,444	9,368	8,379	950	14,577	25,363
July-September 1946	37,342	9,243	8,319	877	14,293	27,573
October-December 1946	36,255	8,658	8,159	939	14,107	25,058
January-March 1947	35,526	7,746	7,930	928	14,443	16,710
April-June 1947	34,558	7,062	7,970	794	14,883	14,989
July-September 1947	31,178	6,004	7,046	691	12,709	16,296
October-December 1947	33,810	5,975	7,396	771	13,774	16,945
January-March 1948	30,323	5,542	6,779	781	12,653	15,075
April-June 1948	29,911	5,081	6,939	785	13,279	13,953
Clinics, hospitals, and other institutions						
July-September 1942	91,865	10,887	26,019	3,425	44,319	45,574
October-December 1942	96,353	11,045	27,814	3,046	47,116	47,218
January-March 1943	91,277	11,503	30,108	2,975	40,930	48,005
April-June 1943	90,290	11,490	28,657	3,338	39,896	53,010
July-September 1943	85,250	11,659	25,798	3,238	37,058	58,628
October-December 1943	72,549	10,575	20,925	2,462	32,349	55,067
January-March 1944	76,480	11,520	22,097	2,921	35,939	55,802
April-June 1944	71,818	11,674	21,090	2,935	32,022	57,409
July-September 1944	59,883	11,898	18,097	2,832	23,806	58,991
October-December 1944	50,788	10,106	16,076	2,436	19,896	42,160
January-March 1945	55,320	11,868	18,046	2,590	20,617	51,914
April-June 1945	62,112	12,456	21,673	3,162	22,320	59,044
July-September 1945	56,635	12,766	20,048	2,697	19,011	61,605
October-December 1945	54,283	13,942	18,526	2,462	17,478	60,739
January-March 1946	65,038	18,148	21,705	2,797	19,832	74,211
April-June 1946	64,267	18,951	20,612	2,908	18,948	79,163
July-September 1946	62,482	19,947	19,695	2,596	17,847	84,735
October-December 1946	57,630	18,764	18,808	2,514	15,667	80,765
January-March 1947	59,205	18,813	20,100	2,661	16,112	79,363
April-June 1947	59,427	17,539	20,518	2,818	17,199	80,600
July-September 1947	59,584	16,604	19,953	2,789	19,328	87,896
October-December 1947	51,571	14,945	17,286	2,340	15,985	77,212
January-March 1948	53,209	14,205	17,140	2,887	18,125	69,953
April-June 1948	56,406	13,072	18,860	3,466	20,085	74,837

<sup>1</sup> Includes stage "not stated."

Source: Form PHS-688 (VD) (Old No. 8958B)—Public Health Service, Venereal Disease Division, Office of Statistics, 8/10/48 (JMR/RR).







# *The* JOURNAL of VENEREAL DISEASE INFORMATION

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FEDERAL SECURITY AGENCY  
PUBLIC HEALTH SERVICE

### **Submission of Manuscripts**

In order to facilitate the handling of manuscripts submitted for publication in the JOURNAL OF VENEREAL DISEASE INFORMATION, the editor requests that copy be prepared in triplicate, typewritten, double-spaced, with liberal margins. Statistical tables and charts should be set up according to the style used in the JOURNAL, and should be presented on separate sheets, rather than within text material.

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**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office  
Washington 25, D. C. - Price 10 cents. Subscription price: Domestic, 75 cents  
a year; foreign \$1.15**



# The Use of Culture Tests in the Diagnosis of Gonorrhea<sup>1</sup>

Max R. Kiesselbach, Surgeon, United States Public Health Service

Since 1943, when Herrell published his results on the use of penicillin in the treatment and cure of 3 cases of gonorrhea (1), there have been numerous reports of larger studies, with varying dosages and types of administration, showing a high cure rate. There is ample scientific evidence that 1 injection of penicillin in peanut oil and beeswax will cure gonorrhea. Romansky et al. (2, 3) show a cure rate of 93 percent among 75 patients treated with 1 injection of 150,000 units. Thomas and Meyer (4) report an over-all cure rate of 93.5 percent on 675 women. Van Slyke and Heller (5) report a cure rate of 92.2 percent among 1,029 patients treated with a single injection of 200,000 units.

Aqueous penicillin is likewise extremely efficacious in the treatment of gonorrhea with a total dosage of 200,000 units given in 3 injections over a 2-hour period. Heller (6) reports a success rate of 94 percent. Hingson et al. (7) show a cure rate of 97.6 percent among 206 patients with gonorrhea.

These rates of success are from patients diagnosed as having gonorrhea by means of a positive culture confirmed by carbohydrate fermentation tests. Possibilities of reinfection were eliminated by hospitalizing the patients during the period of posttreatment observation. The private physician will ordinarily not experience the degree of success mentioned above if his diagnosis is based on other than a confirmed culture and if the possibility of reinfection is not considered.

Yet there appears to be a feeling that penicillin is not as satisfactory a means of therapy as these studies show, that resistance to penicillin is developing in the same pattern as was found after continued use of sulfonamide drugs. Physicians often tell patients who continue to have urethral discharge after a second or third course of penicillin that they have

"penicillin-resistant" gonorrhea. As a matter of fact, physicians at the Public Health Service venereal disease research centers at Staten Island, N. Y., and at Hot Springs, Ark., have not found to date a single case of confirmed gonorrhea which has resisted treatment with penicillin. True, in a small percentage of cases a second or even a third course of penicillin may be necessary. Cases have been called "penicillin-resistant" gonorrhea when such a diagnosis cannot be substantiated bacteriologically by cultures.

A study<sup>2</sup> was undertaken by the Venereal Disease Division of the United States Public Health Service, with the cooperation of a State health department, to determine the efficacy of 200,000 units of amorphous penicillin as a cure for gonorrhea. The 2-hour schedule consisted of three intramuscular injections: 50,000 units at 0 hour; 50,000 units at 1 hour; and 100,000 units at 2 hours. The cure rate was 93 percent in the 100 cases which were followed for 10 days or longer, which is within the range of cure rates in the studies cited above. To secure the cases for this study, local health departments throughout the State were asked to send patients to the rapid treatment center for hospitalization and treatment if there was reason to believe they might have gonorrhea. Altogether, 409 cases were referred for confirmation of diagnosis and for treatment, of which only 39.4 percent actually had gonorrhea confirmed by positive culture and carbohydrate fermentation tests. The technic at the time of this study, for positive identification of the gonococcus, was to plate the specimen directly on a modified McLeod medium,<sup>3</sup>

<sup>2</sup> Unpublished data.

<sup>3</sup> The McLeod medium as modified by Thayer and Mahoney (8, 9) consists of a modified McLeod phosphate-infusion agar base medium to which is incorporated (immediately prior to use) the Peizer horse plasma-hemoglobin stock enrichment solution (10).

<sup>1</sup> From the Venereal Disease Division.

with all positive and doubtful cultures being subjected to carbohydrate fermentation tests. Nearly half the patients who were found to be negative on the first culture were given a second and even a third test, yet only 2 cases (1.8 percent) who exhibited a negative culture on first examination showed a positive culture on subsequent tests.

An analysis of 254 patients referred for complete diagnosis and penicillin therapy in a study conducted in 1947 appears in this issue (page 332) of the *JOURNAL OF VENEREAL DISEASE INFORMATION* (11). This study, too, shows that less than half, or 44.1 percent, of the patients referred for complete diagnosis and treatment actually had the tentative diagnosis of gonorrhea confirmed by positive culture and fermentation tests. Of the patients who had a discharge from the urethra or Skene's glands, only half were demonstrated by culture and fermentation tests to have "true" gonorrhea.

Presumably, in the absence of culture and fermentation tests, the referring agencies would have treated all of these patients for gonorrhea. Considering the time and expense of accurate bacteriological diagnosis, this may be an acceptable procedure. This procedure certainly would cure over 90 percent of the "true" gonorrhea cases after one course of penicillin treatment. In many areas, gonococcus cultures are not available, or the physician may not consider it desirable in the individual case to apply this diagnostic procedure before treatment. However, when patients fail to respond to one or two courses of penicillin therapy, the doctor has a definite responsibility, if possible, to establish by cultures whether the gonococcus is the causative organism. It should not be assumed that the patient has penicillin-resistant gonorrhea without further search to find the true cause.

In view of the fact that a patient may exhibit clinical symptoms similar to gonorrhea and still not have the disease, the following general observations are listed to assist the physician in deciding on his

approach to questions of diagnosis and treatment.

1. The diagnosis of acute gonorrhea on the basis of clinical evidence is more reliable in the male than in the female. The typical purulent urethral discharge in the male will be positive on culture tests in a vast majority of the cases (11). A Gram stain of a spread from a male with a typical purulent urethral discharge will usually show gram-negative intracellular diplococci. It is not so simple to establish a diagnosis in a male whose urethral discharge is serous, mucoid, or mucopurulent. Examination of Gram-stained spreads is often inaccurate and inconclusive. Spreads from women are especially subject to error in interpretation (12). There are organisms found in the female genitals which are easily confused with the gonococcus, particularly an intracellular paired coccobacterium which has an obscure identity. Another organism which can be mistaken by technicians is the intracellular staphylococcus, apparently gram-negative, as revealed by a faulty Gram-stain technic. Thus, except in those cases in which the male has a purulent discharge the Gram-stained smear is unreliable as a basis of diagnosis of gonorrhea and, if laboratory work is to be done, the culture technic is much to be preferred.

2. The degree to which a private physician seeks to establish an indisputable diagnosis before treatment can be decided only in relation to the individual circumstances of the patient. These circumstances include the sex activity of the patient and the willingness of the patient to wait for a laboratory report. Any woman who has had recent intercourse with a person known to have gonorrhea should be offered treatment immediately. When there are medicolegal complications, or when a presumptive diagnosis of gonorrhea might create embarrassing personal problems for the patient, cultural confirmation should be sought. Also, the doctor has the responsibility of considering the damaging psychological

effect on some patients should he misdiagnose the infection.

3. It should be remembered, however, that a patient with gonorrhea may come to the physician's office only once. Since it requires a minimum of 3 days to obtain a positive isolation culture confirmed by fermentation tests, care should be taken that in the effort to establish a diagnosis the physician should not miss the opportunity of curing the patient. In explaining the situation to the patient, the physician should point out that treatment given on a presumptive diagnosis does not necessarily mean that the patient actually has gonorrhea.

4. It should not be forgotten that gonorrhea may occur with syphilis simultaneously. Every gonorrhea patient should have a blood test for syphilis at his first visit and at least one such test 3 months after treatment for gonorrhea. If the gonorrhea patient has lesions suspicious of syphilis, penicillin should not be given until the diagnosis of the lesions is established. One of the sulfa drugs will usually control the gonorrhea until syphilis can be diagnosed or ruled out.

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# Results of Culture Tests Among Patients Referred for Gonorrhea Treatment by Hypospray

Harold H. Davidson, Senior Assistant Surgeon,<sup>1</sup> and Maurice C. Shepard, Senior Assistant Sanitarian (R), United States Public Health Service<sup>2</sup>

During November 1947, a study<sup>3</sup> was conducted at the West Tennessee Medical Center, Memphis, Tenn., to evaluate the efficacy of penicillin administered by hypospray in the treatment of gonorrhea. Most of the cases referred to the rapid treatment center for this study had been diagnosed as gonorrhea by the referral agency on the basis of clinical evidence. In a majority of these cases, however, a diagnosis of gonorrhea could not be supported by a confirmed positive culture.<sup>4</sup> It is the purpose of this report to determine the relationship between clinical symptoms and a confirmed positive culture for gonorrhea.

In this report a presumptive positive isolation culture is interpreted to mean primary cultures evidencing colonies resembling those of gonococcus, typical and atypical. All such colonies were oxidase positive. A case was considered as gonorrhea, however, only when a presumptive positive isolation culture could be bacteriologically identified as that of *Neisseria gonorrhoeae* by fulfillment of the following criteria:

1. Demonstration of gram-negative diplococci of typical *Neisseria* morphology.
2. Positive oxidase reaction of purified colonies.
3. Fermentation only of dextrose by the *Neisserian* organism isolate in pure culture.

Table 1 presents the culture outcome distributed by the basis upon which the diagnosis was made at the referral agency, including 41 females who were named as contacts of gonorrhea but who were not examined before admission to the rapid treatment center, and show that 44.1 percent of all referrals had confirmed positive cultures. With few exceptions the interval of time between the referral agency diagnosis and the rapid treatment center examination was less than 24 hours. Two of the 132 cases which were not confirmed as gonorrhea were found to be other *Neisseria*. Ten other cases had a presumptive positive isolation culture, but the strain was lost prior to the confirmation test. If these

<sup>1</sup> Medical Officer in Charge, West Tennessee Medical Center, Memphis, Tenn.

<sup>2</sup> With the technical assistance of Kenneth H. Jenkins, Biostatistician, and Richard W. Bowman, Biostatistician, Venereal Disease Division, U. S. Public Health Service.

<sup>3</sup> Hingson, R. A.; Easley, E. J.; Gray, A. L.; Tucker, C. B.; Kiesselbach, M. R.; Parkhurst, G. E.; Usher, G. S.; Davidson, H. H.: Hypospray administration of penicillin in the treatment of gonorrhea. *J. Ven. Dis. Inform.*, 29: 61-63, 1948.

<sup>4</sup> The new Difco dehydrated chocolate plating medium was used throughout the study. This is a 24-hour medium prepared from Difco G. C. Medium Base Agar enriched with Difco hemoglobin, dehydrated, and Difco supplement B. All isolation plates were examined at the end of 24 hours at 36° C. for evidence of gonococcus colonies. Typical or suspected colonies were fished and emulsified in Proteose

Peptone No. 3 carrying solution and replated on fresh plates for purification. The remaining portion of the growth on the isolation plate was tested for Gram's reaction, cellular morphology, and oxidase reaction. Purification plates were examined after 24 hours at 36° C. for isolated discrete gonococcus colonies. Selected colonies were used for inoculation of carbohydrate fermentation medium and verification of Gram's reaction, cellular morphology, and oxidase reaction. The new B. B. L. C. T. A. medium (Cystine Trypticase Agar) was used for all fermentation reactions. Three tubes of fermentation medium were routinely inoculated—one containing added dextrose, the second added maltose, and the third without added carbohydrate, for carrying strains for further study or reinoculation purposes. Carbohydrate fermentation could usually be read and reported within 18 to 24 hours at 36° C.

**Table 1.—Results of culture tests among cases referred for gonorrhea therapy**

Basis of diagnosis by referral agency	Total cases	Positive culture for gonorrhea confirmed by sugar fermentation test		Presumptive positive culture but strain lost in purification prior to confirmation		Negative culture for gonorrhea	
		Number	Percent	Number	Percent	Number	Percent
		Diagnosed as gonorrhea					
Clinical evidence only.....	196	89	45.4	9	4.6	98	50.0
Positive laboratory evidence.....	17	9	52.9	1	5.9	7	41.2
Total.....	213	98	46.0	10	4.7	105	49.3
		Not previously examined					
Gonorrhea contact.....	41	14	34.1			27	65.9
Grand total.....	254	112	44.1	10	3.9	132	52.0

**Table 2.—Percentage of cases of confirmed gonorrhea by pathology on admission and sex**

Pathology on admission	Male			Female		
	Total cases	Confirmed gonorrhea		Total cases	Confirmed gonorrhea	
		Number	Percent		Number	Percent
Purulent discharge.....	93	78	83.9	30	5	16.7
Mucopurulent, mucoidal, or serous discharge.....	39	9	23.1	21	9	42.9
No discharge suggestive of gonorrhea.....	12	1	8.3	59	20	33.9
Total.....	144	88	61.1	110	34	30.9

10 cases were considered as confirmed positives, then the total confirmed positives out of the 254 would be 48.0 percent. The percentages of confirmed positive cultures in contacts not examined and those patients examined by the referral agency are 34.1 and 46.0 percent respectively.

Table 2 shows the percentage of confirmed gonorrhea cases according to pathology on admission, and by sex. In the males, 88 of 144 cases or 61.1 percent were confirmed as gonorrhea, while only 34 of 110 females or 30.9 percent were so confirmed. The types of discharge suggestive of gonorrhea, as presented in the table, were from either the urethra or Skene's glands. The disease was confirmed in 83.9 percent of the men with a

purulent discharge, in 23.1 percent of those with a discharge that was mucopurulent, mucoidal, or serous, and in 8.3 percent of those who had no suggestive discharge. The respective percentages for women patients were 16.7, 42.9, and 33.9. The difference in the percentages of gonorrhea found in the presence of a purulent discharge between men and women is highly significant, 83.9 and 16.7 percent, respectively. This confirms the belief that a purulent urethral discharge in the male is generally indicative of gonorrhea, whereas in the female a purulent discharge is not conclusive. The disease was confirmed in one-third of the women suspected of gonorrhea in whom there was no discharge suggestive of the disease.

# Men Who Contract Venereal Disease

Morris W. Brody, M. D.<sup>1</sup>

This pilot study is an analysis of patients in American Army hospitals in Italy during the war. It is being reported with the hope that it may stimulate further work in this field. Thousands of subjects should be studied before final conclusions can be drawn.

The source material for the study—350 soldiers—includes 200 men with venereal disease and, as a basis for comparison, 100 men in the medical and surgical wards of a general hospital, and 50 men hospitalized because of psychoneuroses. In addition, the case records of up to 4,000 white and Negro patients were studied to obtain information regarding purely objective data.

In the more detailed analysis of the group of 350 soldiers, the questions were directed to the men individually, and exact answers were required. Because of the personal nature of the study, it was felt that personal interviews, carefully conducted, would secure more valid results than would be possible by studying the entire group by more impersonal methods. Since the men were made aware that they were helping to solve a war problem, they cooperated well.

Much of the information obtained is included in the tables accompanying this article. Space does not permit showing the detailed results of some of the data, particularly that covering the employment background of the soldiers. Other questions, not included in this report, were directed to the men as a check on the information obtained.

The following general conclusions were drawn from the data obtained:

1. There seems to be no difference in the type of religious affiliation between white patients with venereal disease and the white control group. (See table 1.)

2. Among the white soldiers, there was

**Table 1.—Religious affiliation and military rank of 2,000 white patients Army hospitals<sup>1</sup>**

	Venereal disease group		Control group <sup>2</sup>	
	Number	Per cent	Number	Per cent
Total.....	1,000	100.0	1,000	100.0
Religion:				
Protestant.....	631	63.1	630	63.0
Catholic.....	338	33.8	346	34.6
Hebrew.....	7	.7	24	2.4
None.....	24	2.4	0	0.0
Military rank:				
Privates and privates, first class.....	726	72.6	750	75.0
Noncommissioned officers.....	274	27.4	250	25.0

<sup>1</sup> Information obtained from hospital case records.

<sup>2</sup> Men in this group denied ever having had venereal disease.

as large a percentage of noncommissioned officers in the group with venereal disease as in the control group. (See table 1.)

3. Soldiers with relatively little education, both white and Negro, were more likely to contract venereal disease than those who had finished high school or gone to college. (See table 2.)

4. Among both white and Negro soldiers, the group of patients with venereal disease had a higher percentage of men with records of repeated arrests in civilian life and with records of punishment while in the army. (See table 3.)

5. The patients with venereal disease in both white and Negro groups, included a higher percentage of single men. (See table 4.)

6. A higher percentage of men with venereal disease, in both the white and Negro groups, visited professional prostitutes while in civilian life. A higher percentage of men with venereal disease indulged in extramarital sexual intercourse, both as civilians and as soldiers. The men with venereal disease were more libidinous people than those of the control

<sup>1</sup> Assistant Professor of Psychiatry, Temple University Medical School, Philadelphia, Pa.



**Table 2.—Educational attainment of 4,000 patients in Army hospitals <sup>1</sup>**

Educational attainment	White soldiers				Negro soldiers			
	Venereal disease group		Control group		Venereal disease group		Control group	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total.....	1,000	100.0	1,000	100.0	1,000	100.0	1,000	100.0
Grade school.....	361	36.1	263	26.3	740	74.0	500	50.0
Some high school.....	362	36.2	333	33.3	240	24.0	350	35.0
High school graduate or some college.....	277	27.7	404	40.4	20	2.0	150	15.0

<sup>1</sup> Information obtained from hospital case records.

**Table 3.—Record of civilian and Army arrests among 350 patients in Army hospitals**

Record of arrest	White soldiers				Neuro-psychiatric group		Negro soldiers			
	Venereal disease group		Control group				Venereal disease group		Control group	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Total patients.....	100	100	50	100	50	100	100	100	50	100
Soldiers arrested and sentenced in civilian life:										
Never.....	89	89	48	96	47	94	81	81	47	94
One or more times.....	11	11	2	4	3	6	19	19	3	6
Soldiers punished in the Army:										
By courts-martial:										
Never.....	77	77	44	88	47	94	52	52	47	94
3 times or less.....	21	21	5	10	3	6	43	43	3	6
More than 3 times.....	2	2	1	2	0	0	5	5	0	0
By company punishments:										
Never.....	36	36	26	52	32	64	17	17	31	62
3 times or less.....	36	36	13	26	10	20	59	59	13	26
More than 3 times.....	28	28	11	22	8	16	24	24	6	12

**Table 4.—Marital status of 300 patients in Army hospitals**

Marital status	White soldiers				Negro soldiers			
	Venereal disease group		Control group		Venereal disease group		Control group	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total.....	100	100	50	100	100	100	50	100
Single.....	79	79	36	72	80	80	25	50
Married <sup>1</sup> .....	15	15	14	28	20	20	25	50
Divorced.....	6	6	0	0	0	0	0	0

<sup>1</sup> Includes married and separated.

group. A larger percentage of men with venereal disease began heterosexual intercourse in less than 3 months after overseas duty began. All of the above was true for both white and Negro soldiers. (See table 5.)

7. The patients with venereal disease, in both the white and Negro groups, included a higher percentage of men who were heavy drinkers than were included in the control groups. Of the white patients, 2 percent of the control group and 9 percent of the venereal disease group were heavy drinkers. Of the Negro patients, 6 percent of the control group and 23 percent of the venereal disease group were heavy drinkers. Of the neuropsychiatric group, 4 percent were so classified.

8. No differences in civilian occupation nor in regularity of employment in civilian life were shown between the patients with venereal disease and the control groups in either white or Negro soldiers.

9. There was a difference in the average age at which men in each group first experienced heterosexual intercourse. In both Negro groups, this average was 14½ years; in the white venereal disease group, 16 years; in the white control

group, 16⅞ years; and the psychoneurotic group, 17⅞ years.

10. All the men were asked whether they believed sexual intercourse is necessary to maintain good physical health. Many were uncertain. Thirty-six percent of the white venereal disease group replied in the affirmative, as did 12 percent of the white control group and 50 percent of the Negro group. Asked whether they believed masturbation to be injurious to health, 74 percent of both the venereal disease groups replied in the affirmative, as did 55 percent of both control groups.

In addition to the statistical material presented, a number of impressions were gained concerning the behavior patterns of these men with venereal disease.

The patients of the venereal disease groups were less discriminating than the control group patients regarding the females with whom they chose to cohabit. Men with venereal disease more frequently cohabited with a professional prostitute, but those in the control group more often sought to acquire what they called a friend or acquaintance. The members of the venereal disease groups more frequently decided to have sexual

Table 5.—Analysis of sexual behavior among 350 patients in Army hospitals

Type of sexual behavior	White soldiers				Neuropsychiatric group		Negro soldiers			
	Venereal disease group		Control group				Venereal disease group		Control group	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total number of patients.....	100	100	50	100	50	100	100	100	50	100
Men who visited prostitutes in civilian life.....	58	58	14	28	13	26	79	79	13	26
Men who had extramarital sex relations:										
Never or very rarely:										
In civilian life.....	3	3	17	34	23	46	0	0	0	0
In army overseas.....	0	0	17	34	29	58	0	0	3	6
About once a month:										
In civilian life.....	31	31	12	24	8	16	20	20	3	6
In army overseas.....	52	52	29	58	15	30	47	47	28	56
More than once a month:										
In civilian life.....	66	66	21	42	19	38	80	80	47	94
In army overseas.....	48	48	4	8	6	12	53	53	19	38
Men who began sex life less than 3 months after arrival overseas.....	67	67	18	36	20	40	70	70	33	66

relations on the spur of the moment, after being solicited. Men in the control group more often used some discrimination in choosing a consort.

There was no relationship between neurotic personality and the contracting of a venereal disease, except in isolated instances. These isolated cases showed indication of personality problems without sufficient evidence to warrant a diagnosis of psychoneurosis. Some of these men complained of inability to have sexual intercourse while using a condom. Others felt threatened by prolonged abstinence, feared they would lose their potency, and felt compelled to indulge in sexual activity to prove their masculinity. This fear of loss of virility was commonly expressed by nearly all groups of soldiers. One gained the impression, however, that patients with venereal disease felt more insecure than the average person and to them sexual intercourse was a reassurance and proof of their manliness.

A diagnosis of psychopathic personality was made in very few instances, but the number was probably greater than that found in the wards of any general hospital.

There was a positive relationship between venereal disease and one psychiat-

ric entity, namely, intellectual deficiency. A number of men, mentally deficient, not necessarily sexually aggressive, visited prostitutes mainly through the influence of fellow soldiers. This same group did not have the intellectual capacity to apply sensible precautionary measures.

In summary, we get the following picture of the soldier who contracts venereal disease. He has less education than other soldiers. He is more often single, is more unrestrained, carefree, ready to take chances, and more easily influenced. He drinks a little more, and as a civilian was arrested somewhat more frequently. He does not adjust quite as well to army life and receives more courts-martial and company punishments. He begins his sex life somewhat earlier, and as a civilian more often engaged in extramarital intercourse and more often visited professional prostitutes. As a soldier overseas, he began his heterosexual experiences earlier and indulged more frequently. Sexual intercourse is a more important factor in his life and he shows less discrimination regarding the woman with whom he cohabits. He less often selects the woman but is readily solicited by her.

## Reinfection Following Late Syphilis<sup>1</sup>

George E. Peabody, M. D., and Bruce Webster, M. D.

With the advent of rapid treatment schemes, the problem of reinfection in early syphilis has assumed increasing importance. Although occasional reinfection following adequate treatment of early syphilis has been reported, its occurrence has been rare in cases previously

inadequately treated for early syphilis, then allowed to progress to late syphilis, and subsequently adequately treated. In a report of the subject in 1928, Halley and Wassermann (1) state, "There was not a single undoubted instance of a second infection in a patient who had, previously or concomitantly, had syphilis either of the central nervous system or of the heart and aorta." Thomas et al. (2) in 1945 reported a case of primary syphilis developing in a patient with cardiovascular syphilis.

<sup>1</sup>From the Department of Medicine of the New York Hospital and Cornell University Medical College, New York.

Aided by grants from the Barbara Henry Research Fund and the Syphilis Study Section of the National Institutes of Health, Bethesda 14, Md.



Because of the rarity with which such cases have been observed (2, 3), two additional cases of early syphilis following late syphilis are reported herewith.

#### Case No. 1 (NYH No. 196563)

J. M., a 53-year-old white male, first appeared at the New York Hospital in March 1941, complaining of recurring episodes of paroxysmal palpitation, at which time a routine Wassermann test was reported positive in dilution of 1:2. History, past and present, was unremarkable. Physical examination revealed only a systolic murmur auscultable at the base of the heart, and normal sinus rhythm interrupted at intervals by episodes of irregularity shown by electrocardiogram to be auricular premature contractions. The pulse and blood pressure were within normal limits. Whereas no thyroid tissue could be palpated at the base of the neck, X-ray and fluoroscopy of the chest demonstrated a nonpulsatile uniform shadow of increased density extending above and to the right of the arch of the aorta, which was interpreted as substernal thyroid. Serologic tests for syphilis were repeated and Kline diagnostic and Wassermann tests reported "doubtful." Lumbar puncture revealed the spinal fluid Wassermann to be positive in dilutions of 0.2 to 0.6 cc. The diagnosis was (1) cardiac neurosis and (2) asymptomatic neurosyphilis. Antisyphilitic treatment was instituted and extended until September 1943, with total therapy consisting of 22.0 gm. neoarsphenamine, 9.0 gm. tryparsamide, and 8.2 gm. bismuth. Kline diagnostic tests were variably doubtful to negative, and Wassermann tests were consistently negative by October 1941 and thereafter. Repeated spinal fluid examinations were negative after March 1943.

In July 1946, while still seronegative, the patient again presented himself at the Hospital. He had a penile ulcer, which proved positive for *Treponema pallidum* on darkfield examination. This was accompanied by satellite adenopathy. Casual sexual contact was admitted 3 weeks before. A diagnosis of seronegative primary syphilis was made, and he

was treated for 1 week with 2.7 million units of aqueous penicillin G in divided doses. In early August 1946, 2 weeks after completion of treatment, his Wassermann test became positive (undiluted), reverting to doubtful in September, and negative in October and thereafter. Physical examination in July 1946 revealed no change from before, aside from the penile ulcer and adenopathy. The blood pressure was 170/90 mm. Hg.

In December 1947, examination of the heart revealed a "tambour" quality to the second aortic sound which was prolonged and followed immediately by an aortic diastolic murmur. Repeated serologic tests for syphilis: Wassermann, Kolmer complement-fixation, Kahn standard, Kline diagnostic and exclusion, and Mazzini, which had been negative since October 1946, were still negative at this time. An angiocardigram in January 1948 demonstrated the aorta to be uneven and irregularly dilated, in keeping with a diagnosis of syphilitic aortitis. The mass in the right superior mediastinum, noted previously 7 years before, filled with the injected diodrast as it passed through the right innominate artery, thereby representing an aneurysm of that vessel.

Thus, symptomatic reinfection apparently occurred in this patient who was previously adequately treated for asymptomatic neurosyphilis and cardiovascular syphilis with aortitis and aneurysm.

#### Case No. 2 (NYH No. 129434)

E. G., a West Indian Negro male, was 37 years old when referred to the New York Hospital in April 1936 because of a positive serologic test for syphilis. History revealed that, since 1923, he had received an occasional injection in the hip and arm from a private physician because of "bad blood." Physical examination was negative except for the blood pressure, which varied between 138/92 and 150/102 mm. Hg. At this time the Wassermann test was doubtful, and both Kline diagnostic and exclusion tests positive (4+). Spinal fluid examination was negative. X-ray of the chest revealed a

fusiform dilatation of the ascending aorta which measured 7.5 cm. in diameter. The diagnosis was cardiovascular syphilis, with aneurysm of the ascending aorta. Treatment was instituted in April 1936 and continued until November 1938. Total therapy consisted of 17.55 gm. neoarsphenamine, 1.05 gm. silver arsphenamine, and 12.5 gm. bismuth. The blood Wassermann became negative in December 1936 and Kline flocculation tests became negative in January 1938. His case was followed at New York Hospital until October 1940, and periodic Wassermann and Kline tests remained negative to that time. Throughout this period, the blood pressure ranged between 160/100 and 170/120 mm. Hg., and in November 1939 the left border of cardiac dullness was percussed 12 cm. left of the midsternal line in the sixth intercostal space. X-ray of the chest then revealed a minimally enlarged left ventricle and elongation and tortuosity of the aorta, as well as the aneurysmal dilatation previously noted.

The patient did not return to the clinic after December 1940 until December 1941, when he reappeared with clinical and laboratory evidence of secondary syphilis, including a generalized papular rash positive for *T. pallidum* on darkfield examination. Kline diagnostic tests were positive (4+), and the Wassermann positive in a dilution of 1:32. He admitted numerous sexual contacts during the preceding months, but none could be located. Antisyphilitic treatment was carried out from December 1941 to June 1943, with a total of 26.44 gm. arsenoxide, and 8.8 gm. bismuth. The rash disappeared rapidly after the beginning of treatment, and the blood Wassermann titer decreased gradually, ultimately becoming negative in July 1942. The Kline diagnostic test became negative in April 1943. Periodic serologic tests for syphilis for 3 years thereafter, both Wassermann and Kline, were consistently negative. His cardiac status remained unchanged, and the blood pressure persisted at approximately 150/100 mm. Hg. He failed to return to the clinic after June 1946, and has not been located since.

In summary, this patient was presumably symptomatically reinfected following prior adequate treatment for cardiovascular syphilis with aneurysm of the aorta.

### Discussion

Superinfection with heterologous strains of *T. pallidum* has been demonstrated in rabbits and reported in humans (4, 5, 6). As a rule, however, late syphilis, even though adequately treated, is not followed by reinfection with early syphilis. This observation had been explained by Halley and Wassermann (1) in terms of acquired immunity retained following treatment for late syphilis, even in the ensuing absence of the first infection. Reynolds and Moore (7) have suggested that the phenomenon may be due to cure of the original infection and the gradual disappearance of whatever immunity it may have engendered.

### Summary

Two cases of symptomatic reinfection occurring in individuals previously treated for cardiovascular syphilis and, in one case, simultaneous neurosyphilis, are here reported.

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# Contact Investigation in Unorganized Georgia Counties

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The value of contact investigation in finding cases of venereal diseases in areas where there are no local health departments has been demonstrated by a cooperative project of the Venereal Disease Division, United States Public Health Service, and the Georgia Department of Public Health during the fiscal year 1948.

The project was undertaken because, out of Georgia's 159 counties, 74 had nursing service only and 45 had no organized public health service except for the limited service available from the State's six regional offices. Contacts were constantly being reported to the State health department from these unorganized counties, but there were no facilities for locating and investigating them. They served as a reservoir of infection reaching into the counties which were trying to control the diseases. Authorities from these organized counties were urging that some measure be instituted to ameliorate the problem. Most of the counties having nursing service only and many of the counties having no service at all had appropriations set aside for an organized health department, but the State department of health was unable to obtain acceptable personnel to staff these new organizations or to replace personnel resigning from counties once having organized health services. This situation still exists and is Georgia's major public health problem.

A trained venereal disease epidemiologist with long experience in the field was employed to select and train a staff

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NOTE: Beginning with the January 1948 issue of the JOURNAL OF VENEREAL DISEASE INFORMATION, reports on various case-finding demonstrations have been published, as follows: Arkansas (January issue); Oklahoma City (February issue); Louisville-Jefferson County (March issue); Leflore County, Miss. (April issue); and Georgia (May issue). The present report is a demonstration of similar methods in unorganized counties.

of investigators to work in these unorganized counties. The State Merit System set up a classification, "Communicable Disease Investigator," as a basis for recruiting necessary personnel for the project. The classification required a college degree plus a minimum of 1 year of acceptable experience in dealing with the public in work of an investigative nature, such as teaching, social work, or related experience with large organizations. The salary scale for these men was set at \$2,400 to \$3,120. Every known measure of recruitment short of shanghaiing was employed in the effort to obtain men with suitable backgrounds for performing these duties. By August 4 we had been able to obtain only three such men. These were trained and assigned to the three regional offices serving the areas of the State most in need of this service. Finally, in October, five additional men meeting the requirements were obtained, trained, and assigned. This was a total of eight men, one for each of the regional offices and two for making contact investigations in conjunction with our mass VD-TB surveys.<sup>1</sup>

The facilities of Emory University Medical School, Grady Memorial Hospital, and Alto Medical Center were obtained as training centers and the men were trained for a month in the history and philosophy of public health work, in public relations, in epidemiologic and clinical aspects of the venereal diseases, and in the technics of contact investigation.

Upon assignment to the field, they were placed under the administrative supervision of the Regional Medical Directors, but remained under the technical supervision of the Venereal Disease Division of the State health department. They were readily accepted by the regional office

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<sup>1</sup> Bowdoin, C. D.: Mass blood testing in eight Georgia communities. *J. Ven. Dis. Inform.*, 29: 126-131, 1948.



staffs and by the community leaders in the counties which they were to serve.

These investigators faced a challenging task. They had to cover most of the largest State east of the Mississippi. Georgia has one of the largest Negro populations and one of the highest rates of venereal disease incidence and prevalence. The men assigned to the regional offices had to cover an average of 25 counties each. They were given expense accounts and unlimited travel allowances. They were directed to concentrate their attention in the counties having no organized health department, and to offer whatever assistance was possible in the counties having the services of a nurse. They were directed to limit their investigations to contacts of cases of primary, secondary, and early latent syphilis with a history of lesions within the past 6 months.

In order to expedite the investigation of contacts, arrangements were made with the State Medical Center at Alto, Ga., to refer all Epidemiologic Report Forms (ERF's) for unorganized counties within their jurisdiction direct to the investigators at their regional office headquarters instead of first referring them to the Central Statistical Unit in Atlanta. The men themselves after receipt of the ERF's would open the cases with the Central Statistical Unit. All suspects located, examined, and diagnosed as primary or secondary syphilis through the efforts of the investigators in the field were interviewed by them for contacts, and a contact referral form listing the contacts elicited at the referral source accompanied the patient to the rapid treatment center at Alto. Space was provided on these forms for any additional contacts obtained by reinterview at Alto. Any additional contacts were thus returned immediately to the investigators in the field. This form also provided a space for the Medical Center's diagnosis for the purpose of confirming the original diagnosis or to establish the diagnosis of those patients referred to the center by the investigators for observation and diagnosis.

Because of the inaccessibility of diag-

nostic facilities in some areas of the State, the investigators often sent suspects with lesions directly to the Medical Center without making a definite diagnosis. This was more practical than transporting them 50 miles or more for diagnosis prior to treatment. In order that patients could be sent immediately by common carrier to Alto, the investigators were furnished with State travel request forms.

Because of the time spent in recruiting these men, the present report covers results obtained by the full staff of eight investigators for only a 4-month period, plus the first 3 months of work by the first three men hired. In assessing the results, it should be recognized that they were accomplished in a period during which the men also had to learn the areas to which they were assigned, to establish sources of information, to make arrangements with local physicians and health officers for diagnostic examinations, and to establish working arrangements with the Alto Medical Center. Furthermore, they were working in counties where there was a low level of public information about venereal diseases and control methods. Given better conditions for case finding, it is safe to say they could have turned up many times the number of cases. But with these handicaps in mind, the results are as follows:

Number of contacts reported to investigators.....				1,453
Located and examined.....			977	
Not infected.....		373		
Infected.....		604		
Already under treatment.....	200			
Brought to treatment.....	401			
Primary and secondary syphilis.....	130			
Early latent syphilis.....	152			
Other syphilis.....	104			
Gonorrhea.....	12			
Chaneroid.....	1			
Lymphogranuloma venereum.....	5			
Preliminary disposition only.....			62	
Not located.....			414	
Insufficient information to begin investigation.....			21	
Out of jurisdiction.....			225	
Unable to locate.....			82	
Other.....			86	

These figures reflect only a part of the accomplishments of the project investigators. More impressive is their record

of "extracurricular activities" in the control of venereal disease. In many instances, because of the lack of any previous venereal disease control activities they found that there were few reported contacts of primary and secondary syphilis in the counties with no organized health services. Accordingly, they have sought out the "hot spots" of syphilis in their areas and enlisted the cooperation of employers of these groups in doing small-scale serologic or serologic and X-ray examinations of their employees. Such surveys were made in lumber camps in remote areas, laundries in smaller towns, food-handler groups, plantations in south Georgia, and other similar places. These miniature surveys turned up many previously unknown cases and sold the community leaders on the value of public health work.

In addition to projects of this kind in the wholly unorganized counties, the investigators went into the counties having health departments in order to acquaint the personnel of these departments with the work which they are doing and to offer their assistance in facilitating venereal disease control activities in organized counties. These offers were enthusiastically received.

Exhaustive effort was expended by these men to acquaint county health department personnel with effective methods of contact investigation and venereal disease record keeping and to encourage the local health departments to do a better job on their own initiative. The investigators were so welcomed in the organized counties that their services in all matters relating to venereal disease control were in constant demand. On several occasions the investigators planned and conducted regional conferences for the purpose of instructing personnel in local health departments on technics of control and on keeping venereal disease records.

There has been a marked increase in

reports of venereal disease activity since these investigators went into the field. Their work is also reflected in the number of patients sent from each county to the Medical Center for treatment. Where a few months ago many counties were sending no patients to Alto, there is now hardly a county in the State that does not report having sent some patients each month.

The many small but important activities of these men in facilitating venereal disease control in their regions are too numerous to elaborate upon, but it might be said, in general, that they perform on a regional level the duties of a Public Health Representative in venereal disease control.

We in Georgia are convinced of the value of contact investigation as an important method of case finding. It will work when applied by trained and interested personnel. We believe that, with adequate forces, our contact investigation program in Georgia can operate effectively and economically as a major case-finding device for primary and secondary syphilis. We believe that the use of trained investigators of the type we are now using on a limited, experimental basis is the answer. In our opinion, we could profitably and economically use these investigators in sufficient numbers to investigate all contacts of primary and secondary syphilis in the State. If necessary funds can be obtained, we anticipate doing just that. We estimate that a corps of 30 men, approximately 5 men to each regional office, could handle the contacts of primary and secondary syphilis in the State. Contact investigation beamed at finding primary and secondary syphilis must function with precision and speed if it is to be effective. It can do so only if there are trained, interested workers with this as their primary duty—men who are prepared to strike while the iron is hot.

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NOTE: Since this article was written Georgia has increased its number of communicable Disease Investigators to 25.

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of articles concerned with venereal diseases or related subjects which have been published in the better-known journals during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

## AM. J. CLIN. PATH., BALTIMORE

Development of a single standard slide test for syphilis. B. S. Kline. 18: 185-192, Mar. 1948.

Cardiolipin antigens in serologic tests for syphilis. A. S. Giordano, C. S. Culbertson and Margaret W. Higginbotham. 18: 193-198, Mar. 1948.

\*Cardiolipin blood tests in syphilis. John J. Andujar, M. M. Anderson and E. E. Mazurek. 18: 199-211, Mar. 1948.

Clinical and serologic evaluation of 27,103 consecutive slide tests with cardiolipin-lecithin antigen and Kline antigen. B. Levine, B. S. Kline and H. Suessenguth. 18: 212-217, Mar. 1948.

The V. D. R. L. slide test. A comparison with the Mazzini, Kahn and Kolmer tests for syphilis. Daniel Widelock. 18: 218-223, Mar. 1948.

Cardiolipin. J. F. Mahoney. Editorials. 18: 230, Mar. 1948.

Cardiolipin Kolmer antigen in testing icteric syphilitic serums. S. W. Bohls and Phyllis Shaw. 18: 253-255, Mar. 1948.

Phenol red broth medium enriched with rabbit serum for *Neisseria gonorrhoeae* fermentations. J. E. Faber, Jr., Delia Gonzales and M. J. Pelczar. 18: 256-257, Mar. 1948.

### Cardiolipin blood tests in syphilis.

John J. Andujar, M. M. Anderson and E. E. Mazurek. *Am. J. Clin. Path.*, 18: 199-211, 1948.

This is a report on the results of 24,609 blood samples which were subjected to 81,391 tests over a period of 1 year in an effort to study the cardiolipin antigen from both the clinical and laboratory standpoints.

Cardiolipin was contrasted with many other tests on various types of serums taken from: (1) patients with clinically known stages of syphilis, treated or un-

treated; (2) patients with other diseases and conditions yielding so-called false-positive reactions; and (3) normal healthy individuals. At least two and often six or more of the following tests were employed: Kline exclusion, Kline cardiolipin exclusion, Kline diagnostic, Kline cardiolipin diagnostic, Kahn standard, Kahn quantitative, Kolmer quantitative Wassermann, and Kolmer quantitative Wassermann using cardiolipin.

Increased amounts of lecithin were observed definitely to raise the sensitivity of the antigen. The tabulation of 24,381 duplicate Kline exclusion tests using regular and cardiolipin antigens indicates that a proportion of 10 L to 1 C or 10.4 L to 1 C (parts lecithin to cardiolipin) increases the sensitivity without too great a sacrifice of specificity. The results of tests on blood of known syphilitic status with regular and cardiolipin antigens for Kline and Kolmer antigens and regular Kahn antigen were also tabulated. Here, it was indicated that cardiolipin generally possessed a superior degree of specificity but a very slight degree of increased sensitivity. Where a weak-positive serum was tested, the regular antigen yielded the usual false-negative result whereas cardiolipin was positive. The tabulation of 180 tests on false positives revealed several false-positive reactions in a variety of diseases and conditions, such as acute infectious lymphocytosis, acute infectious monocytosis, acute upper respiratory infection, early tertian malaria, pregnancy, early puerperium, brucellosis, vaccinia (youths), viral pneumonia, and



Vincent's angina. In this study cardiolipin was found to be only slightly more specific in several of the common conditions associated with false positivity and did not duplicate some of the earlier enthusiastic reports in this respect. Three case histories are presented wherein cardiolipin tests were entirely negative in direct conflict with strongly positive tests, and three examples of strongly positive cardiolipin tests wherein the regular tests were entirely negative are cited. Three case histories are also given to illustrate one of the curious problems in dealing with cardiolipin, i. e., persistent seropositivity years after clinical cure.

In an evaluation of the status and future role of cardiolipin, the authors conclude that it is technically much easier to work with because of its greater stability and reproducibility; it provides a higher sensitivity and greater specificity than other antigens; the clinician is in need of fewer and better, not more, tests; sponsored universal tests based on cardiolipin be recommended.

BULL. U. S. ARMY M. DEPT., WASHINGTON

\*Infectious arthritides. Joseph J. Bunim.  
8: 458-462, June 1948.

**Infectious arthritides.** Joseph J. Bunim. Bull. U. S. Army M. Dept., 8: 458-462, 1948.

In this paper, the author describes infectious gonococcic arthritis, which originates in a remote focus in the body and travels through the lymph nodes and blood vessels to the synovial membranes, finally invading the joints.

During World War I, gonococcic urethritis was contracted by 250,000 men, of whom 7,500 (3 percent) developed arthritis. During the last war, however, this rate varied from 0.2 to 0.3 percent. At Bellevue Hospital during the first 45 months of sulfonamide therapy, 49 patients with gonococcic arthritis were seen, whereas during the first 45 months of penicillin therapy, only 10 such patients were observed. The incidence of gonococcic arthritis is definitely on the de-

cline due to the early use of chemotherapy, according to the author.

Typically in this disease, a history of exposure is followed by urethritis or cervicitis; a few weeks or perhaps months or years later, arthritis appears. Pain begins in several joints, migrating from one joint to another in a manner resembling rheumatic fever, but after several days the pain is limited to one joint where it remains for days or weeks. A culture and smear of the urethral, cervical, or prostatic exudates will reveal the organism, and the gonococcus complement-fixation test is almost always positive at the end of the second week. In 80 to 90 percent of cases, the complement-fixation test is positive and remains positive for 5 months after the illness; when it returns to negative, the focus of infection is considered to have been eliminated. The synovial fluid will be cloudy in appearance and of diminished viscosity, and X-ray studies of untreated cases of several weeks' duration will reveal ulceration of the cartilage, narrowing of the joint space, and finally, bone destruction. The most destructive changes are seen in such areas as the ankle, wrist, hip, and interphalangeal joints.

The best diagnostic evidence is the positive smear or culture of the synovial fluid, seen in about 30 percent of cases. Other diagnostic criteria include a positive urethral, cervical, or prostatic smear or culture; a positive complement-fixation test; therapeutic response to penicillin, sulfadiazine, or fever therapy; and biopsy. Suggestions for differentiating gonococcic arthritis from rheumatic fever, rheumatoid arthritis, and Reiter's disease are given in detail by the author.

The treatment of choice is penicillin administered intramuscularly in doses of 20,000 to 30,000 units every 3 hours day and night. Failures to this therapy and to sulfadiazine are given 4 to 6 bouts of fever therapy with a temperature of 104° to 106° F. every other day; for this purpose, hyperthermia has been found as satisfactory as triple typhoid vaccine. It is emphasized, however, that the results

of treatment depend upon the time interval between the onset of the arthritis and the initiation of therapy and that the best treatment for gonococcic arthritis is prophylaxis.

**BULL. VEN. DIS., BOSTON**

Industrial hygiene and venereal disease control. J. G. Townsend and J. R. Heller, Jr. 10: 1-3, Apr. 1947.

**CALIFORNIA MED., SAN FRANCISCO**

Reinfection in syphilis. Norman N. Epstein. 68: 374-377, May 1948.

\*Syphilis in pregnancy. Charles W. Barnett and John M. Read. 68: 432-436, June 1948.

**Syphilis in pregnancy.** Charles W. Barnett and John M. Read. California Med., 68: 432-436, 1948.

The authors report the outcome of 341 babies born to 243 syphilitic mothers observed over a period of more than 15 years at the Syphilis Clinic of the Stanford University School of Medicine. The large number of adequately treated patients, particularly those treated before pregnancy, makes this clinical material differ in some respects from that collected by previous investigators.

The diagnosis of syphilis in the child born alive to a syphilitic mother was based upon such clinical evidence at birth or during the first few weeks of life as a skin eruption with positive darkfield examination, *Treponema pallidum* in the umbilical cord, or definite roentgenographic evidence of syphilis of the bones. In the opinion of the authors, a diagnostic test based upon cord blood and upon the blood of the infant examined at intervals during its early life should be carried out by some quantitative procedure that permits a measure of the trend of the titer; the diagnosis should never depend on the persistence of a positive qualitative test for an arbitrarily selected period of time. The diagnosis of syphilis in the mothers was made on the basis of history, physical findings, and blood tests. Treatment of the mother was not initiated until a reasonably certain diagnosis of syphilis had been made.

The results of the survey were tabulated under the following headings: (1) Outcome of treatment according to time of treatment of mother; (2) outcome of pregnancy according to the amount of treatment given during pregnancy to patients who had had none before; (3) outcome of treatment according to the amount of treatment given before pregnancy; (4) outcome of pregnancy in patients with early syphilis at the time of delivery, according to the time and the amount of treatment; (5) results of tests on cord blood in relation to the mother's blood at the approximate time of delivery.

The authors feel that the most important single consideration in an investigation of this nature is the accuracy of diagnosis in the child. An abortion or stillbirth that terminates a pregnancy in a patient with syphilis should not be attributed to the disease unless an autopsy reveals syphilis in the fetus. In the opinion of the authors, the danger of transmitting syphilis from mother to child during pregnancy is less than it has generally been considered to be. Only 10 of 341 infants were proved to have syphilis, and these were born of mothers who had had little or no treatment. In no case in which the mother had received antisyphilitic treatment prior to conception was the infection transmitted to the child. The authors disagree sharply with the findings of Cole and his coworkers in their recommendation that antisyphilitic treatment to every mother who has or has had syphilis be administered throughout each pregnancy, a policy which causes considerable inconvenience and discomfort without demonstrable benefit.

On the basis of this study, the authors conclude that the hazards of syphilis in pregnancy are not as great as they are usually considered to be.

**J. A. M. A., CHICAGO**

Syphilis. Queries and Minor Notes. 137: 1180, July 24, 1948.

\*Penicillin and fever therapy in early syphilis. George X. Schwemlein, Theodore J. Bauer, Robert M. Craig and Jack Rodriguez. 137: 1209-1212, July 31, 1948.



\*Granuloma inguinale. Treatment with streptomycin. Lydia C. Marshak and Jack Rodriguez. 137:1293-1297, Aug. 7, 1948.

**Penicillin and fever therapy in early syphilis.** George X. Schwemlein, Theodore J. Bauer, Robert M. Craig and Jack Rodriguez. J. A. M. A., 137:1209-1212, 1948.

In this study of the concomitant use of penicillin and fever therapy in early syphilis, 297 patients, divided into 2 groups, were treated with the same total amount of penicillin (1,200,000 units), administered over periods of 7½ days and 30 hours, respectively.

On schedule A, 109 patients were completely treated between January 4 and July 29, 1945. Each received 20,000 units of sodium penicillin intramuscularly every 3 hours for 60 doses over 7½ days, plus three 3-hour sessions of artificial fever at 106° F. (rectal) level on alternate days, beginning 23 hours after penicillin was started. The observation period varied from 16 to 23 months. There were 9 cases of primary seronegative syphilis; 27 of primary seropositive syphilis (including 2 reinfections); 64 of secondary syphilis (including 1 reinfection); and 9 cases of relapsing early syphilis.

Patients with positive, significant serologic titers after 12 months' observation were grouped as failures. Sixty-eight of the seropositive patients achieved seronegativity after treatment; 4 of these subsequently relapsed. The 16 failures on this schedule consisted of 2 patients with relapsing primary syphilis; 5 with primary syphilis progressing to secondary syphilis; 5 with relapsing secondary syphilis; and 4 with serologic relapse. Reactions consisted of local and systemic Herxheimer reactions which were apparent before fever was introduced.

On schedule B, 188 patients completed treatment within the period December 27, 1944, through July 30, 1945. Each patient received 50,000 units of sodium penicillin intramuscularly every 2 hours for 12 doses, beginning a day prior to fever (600,000 units total). The patient was

then placed in the hypotherm and given 6 hours of fever at 106° F. (R) level receiving 100,000 units of penicillin intramuscularly at each hour of elevated temperature (600,000 units total). This provided a total dose of 1,200,000 units of penicillin and 6 hours of fever in approximately 30 hours. Observation covered a 16- to 23-month period. There were 18 cases of primary seronegative syphilis; 35 of primary seropositive syphilis (including 1 reinfection); 128 of secondary syphilis (including 3 reinfections); and 7 cases of relapsing early syphilis.

Eighty-three of the seropositive patients achieved seronegativity; 9 of the 83 subsequently relapsed. Fifty-two patients on this schedule were failures. There were 4 patients with relapsing primary syphilis; 5 with primary syphilis progressing to secondary syphilis; 18 with relapsing secondary syphilis; 24 with serologic relapse; and 1 with neurorecurrence. Reactions consisted of local and systemic Herxheimer reactions which were apparent before fever was introduced.

The cumulative failure rate on schedule A was 17.9 percent as compared with a cumulative failure rate of 40.1 percent on schedule B. According to the results of this study, fever therapy and penicillin administered over a 7½-day period proved to be more effective than the 30-hour method.

**Granuloma inguinale. Treatment with streptomycin.** Lydia C. Marshak and Jack Rodriguez. J. A. M. A., 137:1293-1297, 1948.

This report, based on a survey of 122 granuloma inguinale patients observed from November 1943 to May 1947, places special emphasis on the case histories of 11 who received streptomycin therapy.

Eighty-eight of the patients were found to have lesions limited exclusively to the external genitalia, but lesions located on the perineum, perianal area, pubis, and thighs were present in 12 patients and on the cervix in 1 individual. Donovan



bodies, the causative agents, were found to be present in material aspirated from fluctuant inguinal buboes in 2 patients, which indicates the associated lymphatic pathogenesis of the disease. Of 64 patients adequately treated with antimonial drugs, complete healing was evidenced in 57 (89.1 percent), while the remaining 7 (10.9 percent) failed to respond to antimonial preparations administered regularly over a period of from 1 to 3 years. Toxic reactions (nausea, vomiting, and generalized aching) were observed in many patients treated with larger doses of antimonial preparations, particularly with antimony potassium tartrate.

Eleven case histories of granuloma inguinale patients were presented in detail. All were treated with streptomycin varying in total dosage from 3.4 to 12.16 gm., administered over a period of 15 to 41 days. Three patients experienced relapse after a period of 3 weeks to 8 months. The total dosage of these three varied from 4 to 6.4 gm., given over a period of 18 to 41 days. The total dosage of those with favorable response ranged from 3.4 to 12.16 gm., administered over a period of 15 to 30 days. It is apparent that the total dose and time-dose relationship are yet to be ascertained.

All patients treated with streptomycin showed an immediate favorable response, with disappearance of Donovan bodies and healing of lesions. A progressive resolution of the lesions was observed long after streptomycin therapy was discontinued. Four patients, with lesions of from 2 to 28 years' duration, whose disease had been resistant to antimonial therapy, showed prompt response to streptomycin. No signs of developing resistance to streptomycin were observed in one patient re-treated after relapse. Eight patients observed for 2 to 15 months also showed no signs of relapse.

The authors conclude that streptomycin is a valuable drug in the treatment of granuloma inguinale, particularly when there is little response to treatment with antimonial drugs over a period of years.

#### J. INVEST. DERMAT., BALTIMORE

\*Reactions to penicillin therapy for syphilis. Evan W. Thomas, Simeon Landy and Corinne Cooper. 10: 77-83, Feb. 1948.

Penicillin treatment of neurosyphilis. A study of forty-five cases that had previously received chemotherapy. Leslie Paxton Barker. 10: 169-177, Mar. 1948.

**Reactions to penicillin therapy for syphilis.** Evan W. Thomas, Simeon Landy and Corinne Cooper. J. Invest. Dermat., 10: 77-83, 1948.

The authors report their observations on reactions to the penicillin treatment of over 10,000 patients with syphilis at the Bellevue Rapid Treatment Center. The five different types of skin reaction noted include the following:

1. Urticarial reactions. These reactions, which were seen in about 2.5 percent of the patients treated, had an incubation period of from 6 to 12 days and varied in intensity from mild pruritus with a few urticarial lesions to very severe pruritus with marked angioneurotic edema, attacks lasting from 4 to 6 days. Although penicillin therapy usually could be continued without prolonging the attack, in some cases it was necessary to stop treatment because of the severity of reactions. Treatment was well tolerated in three patients in whom therapy was resumed after 10 days, it is noted.

2. Exacerbation of secondary syphilitic lesions. This reaction, which consists of an exacerbation of the secondary syphilitic lesions, occurs from the sixth to tenth day after the beginning of penicillin therapy and has the appearance of an actual relapse of secondary syphilis, except that darkfield examinations of serums from the lesions are negative. The exacerbations in this study lasted from 4 to 10 days and subsided whether or not penicillin therapy was continued. It is stated that this reaction, which resembles a delayed Herxheimer reaction, has never been noted in the rapid treatment of secondary syphilis with agents other than penicillin.

3. Erythematous and papular rashes. In most instances, this reaction appeared

as a generalized erythema or as localized areas of dermatitis, consisting of papules located on the trunk and extremities, occasionally accompanied by pruritus. Treatment was consistently continued and the symptoms disappeared within a few days in each instance.

4. Local dermatitis at site of injections of penicillin. This relatively unimportant reaction is considered to be the result of local irritation of the skin due to repeated injections of penicillin; it is seen about 3 or 4 days after the onset of therapy. The authors believe the penicillin itself to be an irritant also.

5. Bullous dermatitis. In two patients who developed a dermatitis with large bullae on the exposed surfaces of the upper extremities, it is believed that photosensitization may have developed as a result of penicillin therapy.

Since the explanation of these reactions is obscure and these phenomena are of interest from the point of view of allergy, further study is recommended by the authors.

#### J. TROP. MED., LONDON

Treatment of epidemic typhus with chloromycetin. Eugene H. Payne, Jose A. Knaudt, and Sylvio Palacios. 51: 68-71, Apr. 1948.

Yaws. Annotations and Abstracts. 51: 84, Apr. 1948.

#### J. UROL., BALTIMORE

Clinical observations on the nature of urogenital gonorrhea. John H. Dougherty, Carl S. DiLucia, Angelo DiDonna and John C. Riddler. 57: 84-93, Jan. 1947.

#### LANCET, LONDON

Absorption of penicillin given by mouth. H. C. Stewart and J. R. May. 2: 857-862, Dec. 13, 1947.

Penicillin and syphilis. Annotations. 1: 604, Apr. 17, 1948.

Homologous serum hepatitis. Review of 216 cases. D. Borensztejn. 1: 941-944, June 19, 1948.

#### M. ANN. DISTRICT OF COLUMBIA, WASHINGTON

\*A discussion of the clinical application of titrated or quantitative serologic tests for syphilis. S. Ross Taggart. 17: 135-142, Mar. 1948.

Streptomycin. A review of the basic principles and their clinical application. Harold L. Hirsch, Jean J. Vivino and

Harry F. Dowling. 17: 311-325, 368-369, June 1948.

Penicillin era in the control of gonorrhea. S. Ross Taggart. Editorials. 17: 457, Aug. 1948.

**A discussion of the clinical application of titrated or quantitative serologic tests for syphilis.** S. Ross Taggart. M. Ann. District of Columbia, 17: 135-142, 1948.

In this article the author evaluates the use of quantitative serologic tests in the treatment of syphilis. The principle of the quantitative test is discussed and factors which contribute to variations in the titer are presented. These factors, which are discussed at length, include (1) laboratory reporting, (2) use of a complement-fixation or a flocculation test, and (3) changes of dilution of more than one tube for a significant determination.

The laboratory may report a titrated STS (serologic test for syphilis) in units or in tube dilution directly. The dilutions may represent an arithmetic series, such as 1:5, 1:10, 1:20, 1:30, etc., or a geometric series, such as 1:2, 1:4, 1:8, etc. A table is presented which compares the arithmetic and geometric recordings of serologic tests and their expression in units.

The use of the quantitative serologic test in the various stages of syphilis is discussed in detail. In adequately treated early infectious syphilis, unless a relapse has occurred, the STS falls to negativity in approximately 75 percent of cases within the first 3 months. Patients with primary and secondary syphilis in whom negativity of the STS has not been attained over varying periods of time fall into three general categories: (1) Treatment failures; (2) titer decrease, with increase after varying time periods; and (3) titer decreases to 16 units or less, but not to complete negativity. These three categories are discussed in detail. Patients treated for primary or secondary syphilis with negative spinal fluid, negative STS, or a persistently low blood STS titer of less than a flocculation dilution titer of 1:4 (16 units) or a complement-fixation dilution titer of 1:2 (8 units) for more than 1 year after rapid

treatment for syphilis require no further therapy unless marked rises in titer occur.

In the majority of patients with early latent syphilis of less than 6 months' duration, the STS will become negative within 1 year following treatment. Patients with latent syphilis of more than 6 months' duration usually require more than 1 year to become seronegative. As a rule, the longer the duration of latent syphilis, the longer the time required for the STS to become negative. Quantitative serologic tests are of value in the follow-up of such treated patients. If the follow-up STS titer shows definite and sustained rise, the need for further anti-syphilitic treatment is indicated. According to present knowledge, patients who continue to have gradual downward trends in titer over a period of years require no further treatment.

The value of the quantitative test in pregnancy and in infants born to syphilitic mothers is also discussed. In neurosyphilis, the spinal fluid findings are the only reliable guides to treatment. Quantitative spinal tests are helpful in observing patients after treatment. As in the blood, if the titer remains high or shows a rising pattern, additional treatment is indicated.

#### M. J. AUSTRALIA, SYDNEY

British Medical Association News. [Venereal disease.] Scientific. 1: 630-633, May 15, 1948.

#### M. OFFICER, LONDON

The advertising of medicines and treatments. [Venereal disease.] 79: 264-265, June 19, 1948.

#### M. PRESS, LONDON

A post-war survey of venereal disease. Sydney M. Laird. 217: 163-165, Mar. 5, 1947.

#### MED. MAANDBL., BATAVIA

Een hulpmiddel voor het verkrijgen van gonococcen in zuiveren kweek. [Manipulation to obtain pure gonococcus culture.] G. K. Han. Pp. 181-182, May 1947. [Abstracted in Bull. Hyg., London, 22: 668, Oct. 1947.]

#### MEM. INST. OSWALDO CRUZ, RIO DE JANEIRO

Pesquisas sobre a imunidade da Framboesia tropica no homem. Observações feitas

em 33 superinoculações e 7 reinoculações. [Immunity in yaws: studies of 33 superinoculations and 7 reinoculations.] F. N. Guimarães. 44: 649-685, Dec. 1946. [Abstracted in Trop. Dis. Bull., London, 45: 344, Apr. 1948.]

#### MISSISSIPPI DOCTOR, BOONEVILLE

The problem of granuloma inguinale. Swan Burrus, Jr. 25: 350-351, Apr. 1948.

#### NEDERL. TIJDSCHR. V. GENEESK., AMSTERDAM

Injury to the haemopoietic system during arsenotherapy for syphilis complicated by diphtheria. [Beschadiging van de bloed-bereidende organen tijdens arsenobenzol-behandeling van lues, welke door diphtherie is gecompliceerd.] W. J. Hohmann. 90: 1562, 1946. [Abstracted in Brit. J. Ven. Dis., London, 23: 182, Dec. 1947.]

#### NEW ENGLAND J. MED., BOSTON

Unusual reaction to penicillin in oil and wax. Clarence E. Burt and Sheldon M. Caplan. 238: 804-805, June 3, 1948.

Yaws in Massachusetts. John G. Downing. 239: 17-18, July 1, 1948.

\*Serum concentrations of penicillin following the administration of crystalline procaine penicillin G in oil. William L. Hewitt, Philip Whittlesey and Chester S. Keefer. 239: 286-290, Aug. 19, 1948.

**Serum concentrations of penicillin following the administration of crystalline procaine penicillin G in oil.** William L. Hewitt, Philip Whittlesey and Chester S. Keefer. New England J. Med., 239: 286-290, 1948.

This paper presents pharmacologic data concerning the use of crystalline penicillin G suspended in oil. Fifty-seven subjects received 1 cc. of sesame oil containing 300,000 units of crystalline procaine penicillin G intramuscularly, and 48 subjects received 2 cc. of sesame oil containing 600,000 units of crystalline procaine penicillin G intramuscularly. The serum concentrations of penicillin during the 48 hours following administration are given in table form.

In the group receiving 300,000 units, the concentration was determined  $\frac{1}{2}$  hour after administration in 19 cases and varied from 0.04 to 0.64 unit per cubic centimeter of serum. Penicillin concentrations determined at  $\frac{1}{2}$  hour and 4 hours after injection showed that the maximum occurred uniformly at 4 hours and varied from 0.08 to 2.5 units per cubic centimeter



of serum. In the group receiving 600,000 units, the serum contained 0.02 to 1.30 units per cubic centimeter of serum  $\frac{1}{2}$  hour after administration. The maximum serum concentration occurred 4 hours after administration in all but 2 subjects and varied from 0.08 to 2.5 units per cubic centimeter of serum. The first group produced demonstrable penicillin concentrations 12 hours after administration in all subjects and 24 hours after injection in 92 percent of the subjects. The second group produced demonstrable penicillin concentrations 24 hours after administration in all subjects and 48 hours after injection in 89 percent of the subjects.

The results obtained with procaine penicillin G in sesame oil from this study were compared with the results obtained previously by other investigators working with crystalline sodium penicillin G in peanut oil and beeswax. In contrast to the peak levels obtained after the injection of peanut oil and beeswax mixtures, concentrations of penicillin tend to rise more slowly after the administration of procaine penicillin G. Hence, the maximum concentrations obtained after the administration of 1 cc. of peanut oil and beeswax containing 300,000 units of crystalline sodium penicillin G varied from 0.08 to 5.0 units per cubic centimeter of serum, whereas a like dose of crystalline procaine penicillin G in sesame oil produced concentrations varying from 0.04 to 0.64 unit. The result of increased dosage of crystalline procaine penicillin G is largely one of prolongation of an effective concentration rather than an increase in the magnitude of the level during the 4 hours following administration. Another advantage of procaine penicillin G in oil is the elimination of beeswax, which is believed to be a cause for many unfavorable reactions. The authors conclude by stating that crystalline procaine penicillin G in oil was superior to crystalline sodium penicillin G in peanut oil and beeswax for maintaining an effective serum penicillin concentration for 24 hours after injection.

#### NEW YORK STATE J. MED., NEW YORK

Routine examination of cerebrospinal fluid. Albert H. Harris and Carl Lange. 48: 418-423, Feb. 15, 1948.

Penicillin treatment of early congenital syphilis. Dabney Moon-Adams and Charlotte Marker. 48: 1245-1249, June 1, 1948.

Prophylactic instillation of silver nitrate. Raymond E. Meek. Correspondence. 48: 1304, June 1, 1948.

#### NORTH CAROLINA M. J., WINSTON-SALEM

An outline for diagnosis and modern treatment of central nervous system syphilis. Augustus S. Rose. 8: 285-290, May 1947.

Present trends in the treatment of syphilis. David G. Welton. 8: 348-354, June 1947.

#### NORTHWEST MED., SEATTLE

General infections of pregnancy. [Gonorrhea.] John C. Brougher. 47: 356-358, May 1948.

#### NURSING TIMES, LONDON

Social work in a venereal disease clinic. E. M. Ryal-Horwood. 44: 468, June 26, 1948. [Listed in Health Articles of the Week, New York, 28: 4, July 30, 1948.]

#### OREGON HEALTH BULL., PORTLAND

Hygienic lab again high in rating. [Serodiagnosis for syphilis.] 26: 3, July 14, 1948.

#### PENNSYLVANIA M. J., HARRISBURG

Venereal disease notes. From the Pennsylvania Department of Health. 51: 874, May 1948.

#### PRESSE MÈD., PARIS

Serology in Senegalese in relation to syphilis. [Serologie syphilitique des Senegalais.] Julliard. 54: 524, 1946. [Abstracted in Brit. J. Ven. Dis., London, 23: 138, Sept. 1947.]

#### PUB. HEALTH LAB., OLEAN

\*Investigation of serologic procedures using antigens containing cardiolipin. 1. Suggestions for a preliminary study. J. F. Mahoney, M. R. Zwally and A. Harris, 5: 2-4, Nov. 1947.

Program of the U. S. Public Health Service Communicable Disease Center Laboratories. Seward E. Miller. 5: 5-8, Nov. 1947.

\*Report of Committee to Study Ways and Means by Which the United States Public Health Service Can Assist Public Health Laboratories. [Friend Lee Mickle, Chairman.] 5: 9-16, Nov. 1947.

An egg medium for the primary isolation of the gonococcus. Preliminary Report. Nell Hirschberg. 6: 83-85, July 1948.

**Investigation of serologic procedures using antigens containing cardiolipin. 1.**

**Suggestions for a preliminary study.** J. F. Mahoney, M. R. Zwally and A. Harris, Pub. Health Lab., 5: 2-4, 1947.

In connection with the development of cardiolipin and the discovery that it can serve as a component antigen in tests for syphilis, the authors point out that it remains to be demonstrated how completely the compound can be integrated into the technic of public health laboratories and what advantages from its use will accrue to the individual whose blood is being tested and to the medical profession in general. Although serologists who have worked with purified cardiolipin and lecithin are said to be optimistic concerning improvements in the serology of syphilis to be brought about by using these phospholipins as essential antigen components, perfection of serologic technics now depends upon determination of the practicality of the procedures already published, the number of which suggests that a survey of the field is necessary to guide future improvements in serologic methods.

The Venereal Disease Research Laboratory has asked that the Conference of State and Provincial Public Health Laboratory Directors investigate the adaptability of serologic procedures using antigens containing cardiolipin, by means of parallel mass testing of routine specimens in laboratories of the State health departments. The data resulting from the testing of serums, using cardiolipin technics with standardized antigens, would be used to ascertain the advantages of methods employing cardiolipin as against the older lipoidal methods and the desirability of the preparation and standardization by a central laboratory of all lots of antigens for each method; in such a study there would incidentally accrue information on the specificity of the cardiolipin technics and the efficacy of this type of study in evaluating future changes in the serology of syphilis.

If this program is to be undertaken, it is suggested that a committee of the members of the Conference of State and Provincial Public Health Laboratory Directors be appointed to confer with the

representatives of the Venereal Disease Research Laboratory, being also available at the termination of the project to assist in the guidance of the analyses of the data into a delineation most beneficial to public health laboratories.

It is realized that even though such a suggested trial program were successful in all respects, many phases of laboratory serology will remain to be studied, foremost of which is the determination of the optimum level of reactivity for serologic procedures and the standardization of the technical methods at that level of reactivity.

**Report of Committee to Study Ways and Means by Which the United States Public Health Service Can Assist Public Health Laboratories.** (Friend Lee Mickle, Chairman.) Pub. Health Lab., 5: 9-16, Nov. 1947.

The Committee to Study Ways and Means by Which the United States Public Health Service Can Assist Public Health Laboratories was established when World War II disrupted the programs of these laboratories and the need for assistance in solving new problems arose. Some of the problems for which Federal assistance would be of significant help are as follows:

1. Uniformity of equipment and supplies. It is suggested that the Conference of State and Territorial Health Officers endeavor to make possible greater uniformity in laboratory equipment and supplies and that the United States Public Health Service interest manufacturers in keeping the flow of needed items moving to laboratories.

2. Postal regulations. It is recommended that the problem of specimen containers not being accepted for mailing by some local postmasters be handled as a liaison activity between the Service and Federal Post Office Department.

3. Training of personnel. It is suggested that the present 2-week courses in the serology of syphilis being given to public health laboratory personnel by the Venereal Disease Research Laboratory be expanded as the Service sees fit to do so.



4. Federal grants-in-aid. Since some States do not adequately support the services of their central public health laboratories, it is suggested that Federal grants-in-aid for general rather than specific purposes be appropriated by Congress for laboratory activities, these funds to be administered by the United States Public Health Service. Some laboratory directors feel that unless at least three-fourths of the total laboratory budget is obtained from State funds, the laboratory services of State health departments are potentially in a precarious situation, since Federal grants are apt to recede at any time.

5. Diagnostic antigens and serums. It is felt that well controlled experiments to establish optimum levels of sensitivity and specificity are needed as a preliminary toward acceptance of standards for diagnostic reagents by commercial manufacturers. Collaboration is felt to be desirable between the Conference and the Venereal Disease Research Laboratory in setting an optimum level of sensitivity for cardiolipin antigen in order to arrive at a minimal number of standard test procedures for the serodiagnosis of syphilis.

Among other recommendations set forth in detail are the development of strategic State laboratories which would do only certain routine tests, using Federal aid in obtaining special facilities for regional use; continuation of the consultation service now being offered by specialists in their respective fields; and the calling of annual conferences of State and Territorial laboratory directors with the Surgeon General of the United States Public Health Service and his staff. Also recommended is the assignment by the Service of qualified officers to study the basic requirements for programs of in-service training in public health laboratories, designed to enhance the career service of individuals entering public health laboratory work in State health departments.

#### PUB. HEALTH REP., WASHINGTON

Objectives and program of the Arkansas cancer detection project. [Relationship to venereal disease.] Allen N. Koplin. 63 : 813-821, June 18, 1948.

Techniques in evaluation of rapid antisymphilitic therapy. Albert P. Iskrant, Richard W. Bowman and James F. Donohue. 63 : 965-977, July 23, 1948.

#### REV. ARGENT. DERMATOSIF., BUENOS AIRES

Estudios experimentales sobre la patogenia y el tratamiento de los accidentes producidos por los arsenicales antilueticos. [Experimental study of the pathogeny and treatment of accidents arising from the use of arsenicals in syphilis.] A. Zubiri Vidal. 31 : 157-170, June 1947. [Abstracted in Bull. Hyg., London, 22 : 765, Dec. 1947.]

Aportaciones al estudio de la hipersensibilidad cutanea a los arsenobenzoles. [Contribution to the study of cutaneous sensitivity to arsenicals.] E. De Gregorio. 31 : 171-180, June 1947. [Abstracted in Bull. Hyg., London, 22 : 765-766, Dec. 1947.]

Accidentes de neosalvarsan. Estudio experimental de la nocividad del producto. [Accidents with neosalvarsan. Experimental study of the drug.] M. Halty. 31 : 180-187, June 1947. [Abstracted in Bull. Hyg., London, 22 : 766, Dec. 1947.]

#### REV. GASTROENTEROL., NEW YORK

Syphilis of the stomach. Report of a case with gastroscopic findings and intragastric photographs in color. Henry A. Rafsky, Michael Weingarten and William F. Herzig. 15 : 359-366, May 1948.

#### SCHWEIZ. MED. WCHNSCHR., BASEL

Effect of penicillin on various forms of icterus associated with syphilis and its treatment. P. Robert. 78 : 123, Feb. 14, 1948. [Abstracted in J. A. M. A., Chicago, 137 : 1340, Aug. 7, 1948.]

#### SC. NEWS LETT., WASHINGTON

New chemical improves blood test for syphilis. 53 : 251, Apr. 17, 1948.  
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#### SIGHT-SAVING REV., NEW YORK

What causes blindness in children? [Ophthalmia neonatorum]. C. Edith Kerby. 18 : 21-33, Spring 1948.

#### SOCIAL HYG. NEWS, NEW YORK

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#### SOCIAL HYG. NEWS & VIEWS, WASHINGTON

Protecting mothers and babies. [Syphilis.] 16 : 2, June 1, 1948.  
P-T. A's are staunch allies. [Venereal disease.] 16 : 3, June 1, 1948.

#### SOUTH AFRICAN M. J., CAPE TOWN

The management of syphilis. Treatment schedules. 22 : 293-294, Apr. 24, 1948.



- SOUTH. M. J., BIRMINGHAM**  
The venereal granulomas: a comparative study of these diseases in Florida. Wesley W. Wilson. 41: 413-419, May 1948.  
Evaluation of the newer therapy of ulcerative colitis. [Lymphogranuloma venereum.] J. Arnold Bargen. 41: 646-651, July 1948.
- SURGERY, ST. LOUIS**  
The surgical treatment of aneurysms of the abdominal aorta. [Syphilis.] Geza de Takats and John T. Reynolds. 21: 443-454, Apr. 1947.
- TEXAS STATE J. MED., FORT WORTH**  
Cardiovascular syphilis. R. H. Kampmeier. 44: 23-28, May 1948.  
The present status of synergistic and additive chemotherapy. John A. Kolmer. 44: 81-85, June 1948.  
Report of Committee on Venereal Diseases. Transactions, eighty-first annual session of the State Medical Association of Texas, Houston, Apr. 26-29, 1948. 44: 122-123, June 1948.  
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Rapid treatment for syphilis at Rocky Mountain Hospital, Overton, Texas. D. A. York, Jr. 44: 310-312, Aug. 1948.  
Cardiolipin and Kolmer antigens in the complement-fixation test for syphilis. John A. Kolmer and Elsa R. Lynch. 44: 312-316, Aug. 1948.
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Is specific treatment always necessary in pregnant syphilitic women? [Er spesifikk behandling alltid nødvendig hos svangre med lues antea?] A. Madsen. 66: 772, 1946. [Abstracted in Brit. J. Ven. Dis., London, 23: 137, Sept. 1947.]  
Single injection treatment of gonorrhoea with penicillin. [Behandling av gonoré med én injeksjon av penicillin.] S. Aarseth and H. T. Sandberg. 66: 769, 1946. [Abstracted in Brit. J. Ven. Dis., London, 23: 141, Sept. 1947.]
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### To the Field

The editor knows that you are more interested in doing a good job than in telling us about it. And that's the way it should be.

There are times, however, when a bit of publicity serves as an inspiration to greater achievement for those actively engaged in the projects and as a guideline to readers who have similar problems.

We know that we are asking a real favor when we say, won't you please "probe" into your various activities and see what you find that might be of interest to other areas? We are especially on the alert for new research and training programs, new methods of case finding, educational experiments, successful cooperative projects, surveys, and control technics, and interesting case reports.

Only with your cooperation can we hope to make "Current Notes and Reports" the kind of clearing house for new ideas and information which will be of maximum value to our readers.

### Venereal Disease Case-Finding Project in New York City

Early in November, New York City will launch an intensive venereal disease case-finding program aimed at bringing more venereal disease patients to private physicians and public clinics for diagnosis and treatment. Public appeal will emphasize signs and symptoms, proper treatment, and necessity to seek diagnosis immediately. All types of mass education mediums will be utilized—foreign and domestic press, radio, television, outdoor and indoor display, pamphlets especially designed for labor and professional groups, and motion pictures.

The project, sponsored by the New York City Department of Health and the United States Public Health Service, is under the direction of Dr. Theodore Rosenthal, venereal disease control officer of the New York City Department of Health. It has the approval and will receive the active support of important civic and professional organizations in the city.

Those who suspect infection will be urged to "go to your doctor or a clinic for a checkup." Free supplies of penicillin will be distributed to private physicians in exchange for contact and morbidity reports.

### Institute on Venereal Disease Control

An institute on venereal disease control under the auspices of the Illinois State Department of Public Health will be held in Illinois, November 15–24. The meetings are scheduled to take place in La Salle on November 15 and 16, and in Springfield on November 18 and 19, and in

Mount Vernon on November 23 and 24.

Among the topics planned for discussion are health education in venereal disease control, pathogenesis of syphilis, syphilis in pregnancy and congenital syphilis, and gonorrhea in the male and in the female.

## **Number of Patients Admitted to Mid-South Medical Center Reaches High of 50,000**

An impressive record of service to the State of Alabama has been revealed in the report that 50,000 patients had been admitted to the Mid-South Medical Center, Birmingham, Ala. This high was reached on August 5, 1948.

These 50,000 patients were new admis-

sions only and did not include readmissions. Of the 50,000 patients, 825 were admitted prior to December 1, 1944, and 14,392 were admitted prior to July 1, 1946. During the first 10 days of August 1948, the average daily patient load at the Center was 631.

## **Venereal Disease Informational Signs Now Available for Public Washrooms**

In conjunction with the current Nationwide educational campaign being waged against the venereal diseases, a permanent-type metal washroom sign has now been made available for use in lavatories of gasoline stations, taverns, theaters, hotels, restaurants, and all public washrooms.

Many of the objectionable features found in washroom signs of this type have been eliminated. The sign, 6 by 8 inches, is light in weight, easily installed with cement or with metal fasteners, attractively designed in red, green, and white, and short and to the point in context. In addition to the information concerning

syphilis and gonorrhea, space is available on the sign to permit the insertion of addresses of local treatment centers.

The combined units of the American Petroleum Industries have already endorsed this sign for use in lavatories of all gasoline stations.

Samples of the sign may be obtained by writing to the Office of Promotion and Industrial Relations, Venereal Disease Division, Public Health Service, Federal Security Agency, Washington 25, D. C. Purchase orders should be mailed to Venereal Disease Education Institute, Raleigh, N. C. Price, 30 cents per sign.



## STATISTICS

## Cases of Syphilis and Gonorrhea Reported to the Public Health Service by State and Territorial Health Departments, April Through June 1948—Fourth Quarter Fiscal 1948

[Known military cases excluded]

Area	Syphilis										Gonorrhea							
	Primary and secondary			Early latent			Late and late latent			Congenital			Not stated			Total all sources	Ratio to prior quarter	
	Ratio to prior quarter		Total all sources	Ratio to prior quarter		Total all sources	Ratio to prior quarter		Total all sources	Ratio to prior quarter		Total all sources	Ratio to prior quarter					
	All sources	Private physician sources		All sources	Private physician sources		All sources	Private physician sources		All sources	Private physician sources		All sources	Private physician sources				
District 1—Total	2,465	0.90	0.86	4,212	1.10	0.98	8,101	1.10	1.03	552	1.05	0.94	394	1.33	1.20	12,439	1.13	0.94
Connecticut	52	1.08	1.24	92	1.30	1.36	147	1.20	1.27	15	(a)	(a)	36	.97	1.00	251	1.43	1.46
Delaware	64	.89	.82	129	2.15	1.49	142	2.29	.72	16	(a)	(a)	43	.77	.41	57	.88	.74
Maine	65	.69	.66	34	1.13	1.18	48	.69	.78	11	(a)	(a)	7	(a)	(a)	105	.97	.78
Massachusetts	137	.76	.78	112	1.47	2.19	336	1.10	1.40	33	.77	(a)	0	(a)	(a)	647	1.18	1.12
New Hampshire	17	(a)	(a)	11	(a)	(a)	30	.77	.82	3	(a)	(a)	0	(a)	(a)	58	1.09	1.02
New Jersey	313	1.02	1.22	782	1.18	1.15	1,119	1.56	1.30	66	1.25	1.07	17	(a)	(a)	1,214	1.03	1.05
New York	1,158	.89	.81	1,793	1.02	.89	3,008	1.00	.98	260	1.08	.99	174	2.76	(a)	7,525	1.17	.87
New York City	977	.90	.78	1,689	1.03	.87	3,987	.98	.93	189	1.01	.76	152	3.62	(a)	6,101	1.21	.76
Pennsylvania	603	.92	.61	1,225	1.06	.73	1,123	1.19	.94	136	.97	(a)	38	1.31	1.43	2,460	1.07	---
Philadelphia	255	.91	.774	774	1.03	---	619	.93	---	34	.72	---	45	1.25	---	1,908	---	---
Pittsburgh	111	.79	---	116	.87	---	167	.98	---	26	.74	---	0	---	---	72	---	---
Rhode Island	31	(a)	(a)	29	1.21	1.00	131	1.25	1.21	11	(a)	(a)	43	.83	1.03	239	1.20	1.40
Vermont	25	1.00	1.00	5	(a)	(a)	17	(a)	(a)	1	(a)	(a)	36	.69	.69	50	.91	.91
District 2—Total	3,100	.87	.92	3,712	1.07	1.16	2,805	1.14	1.24	428	1.10	1.26	104	1.04	(a)	14,865	1.08	.94
District of Columbia	229	.80	(a)	291	1.06	(a)	326	1.07	1.43	27	.90	(a)	0	---	---	3,099	1.10	1.25
Maryland	467	.92	1.30	519	1.05	.97	652	1.15	1.16	61	.90	(a)	46	1.02	(a)	1,875	.95	.81
Baltimore	314	.89	1.58	383	.99	1.00	488	1.09	1.04	28	.78	---	36	1.33	(a)	1,480	.92	.87
North Carolina	730	.84	.83	780	1.07	1.10	252	1.05	1.12	112	1.40	(a)	0	---	---	3,544	1.20	2.33
South Carolina	624	.93	.80	828	1.13	1.55	316	1.05	.90	82	1.12	(a)	0	---	---	2,360	1.21	(a)
Virginia	664	.91	.88	919	1.13	1.41	769	1.45	1.93	83	1.06	(a)	58	1.05	(a)	2,845	1.05	.85
West Virginia	395	.76	.96	375	.90	.80	490	.93	.98	63	1.07	(a)	0	---	---	1,142	.86	.91
District 3—Total	3,234	.87	.90	4,644	1.09	1.16	7,226	1.18	1.18	642	1.08	1.07	453	.98	1.01	14,060	.94	.94
Illinois	940	.79	.90	1,406	1.07	1.22	2,011	1.11	1.07	104	.71	.55	0	(a)	(a)	6,838	.88	.81
Chicago	560	.75	.73	958	.98	1.10	1,177	1.14	1.15	63	.78	.48	0	(a)	(a)	5,349	.87	.78
Indiana	347	.78	1.01	303	1.06	1.12	518	.96	1.06	92	1.24	1.43	25	(a)	(a)	664	.97	1.58
Kentucky	398	.72	.66	344	.91	.98	464	.97	.90	40	.66	.65	428	.46	.48	1,490	1.01	1.50
Michigan	527	.90	.90	680	.84	.85	1,373	.93	.99	133	1.17	1.14	0	1.05	1.09	2,223	.95	.93
Ohio	963	1.12	1.05	1,772	1.30	1.26	2,490	1.57	1.45	232	1.34	1.35	0	---	---	2,630	1.09	1.21
Wisconsin	59	.70	.83	139	1.18	1.42	370	1.64	1.66	41	1.46	1.57	0	---	---	215	.91	1.08

District 4—Total.....	5,472	1.01	1.06	7,514	1.12	.96	8,296	1.01	.93	1,400	1.26	.86	1,985	1.32	1.42	24,380	1.13	1.08
Alabama.....	866	1.46	1.18	1,533	1.46	1.34	1,608	1.09	.98	177	1.75	(a)	1,533	1.46	1.44	1,520	1.08	1.12
Arkansas.....	535	.97	1.043	1,043	.88	.92	2,535	.80	.78	384	.93	.72	1,398	.38	.38	1,398	1.05	1.21
Florida.....	1,326	.93	1.27	1,220	1.00	.85	1,955	1.08	.94	159	1.21	.97	5,379	(a)	(a)	5,379	1.19	1.54
Georgia.....	811	.53	.53	921	.94	(a)	713	.80	.41	159	1.10	(a)	51	1.00	(a)	4,054	1.15	.05
Louisiana.....	672	1.01	.53	929	1.37	.67	649	1.30	.80	176	1.43	(a)	368	1.13	1.68	3,525	1.21	1.32
Mississippi.....	691	1.17	(a)	1,052	1.31	.98	900	1.45	.98	283	1.85	(a)	6	(a)	(a)	2,807	1.98	.85
Tennessee.....	571	.92	.92	816	1.05	1.09	836	1.40	1.26	75	1.36	(a)	0	(a)	(a)	5,697	1.12	.92
District 5—Total.....	1,207	.81	.79	1,456	1.00	1.12	3,078	1.06	1.07	194	.95	1.00	235	1.00	.36	8,397	.94	.88
Arizona.....	94	.87	.92	1,07	1.30	(a)	156	2.60	(a)	16	(a)	(a)	0	(a)	(a)	288	.86	.76
California.....	872	.81	.77	1,082	.96	1.03	2,305	1.05	1.09	146	.93	1.12	208	1.37	(a)	6,561	.95	.88
Nevada.....	47	1.21	(a)	0			134	1.28	1.24	2	(a)	(a)	0	(a)	(a)	163	.85	1.26
Oregon.....	58	.64	.59	50	.56	.64	172	.58	.42	11	(a)	(a)	0	(a)	(a)	358	.84	.74
Washington.....	111	.88	1.00	139	1.14	1.08	201	1.05	1.30	10	(a)	(a)	26	.84	(a)	689	.91	.84
Alaska.....	12	(a)	(a)	48	(a)	(a)	28	(a)	(a)	0	(a)	(a)	0	0	0	121	.65	.65
Hawaii.....	13	.41	(a)	30	(a)	(a)	82	2.16	1.84	9	(a)	(a)	1	(a)	(a)	217	1.21	1.21
District 6—Total.....	160	.93	---	1,028	1.41	---	378	1.23	---	341	1.32	---	4	(a)	---	2,000	1.22	---
Puerto Rico.....	157	.93	---	1,009	1.41	---	372	1.24	---	341	1.32	---	2	(a)	---	1,966	1.22	---
Virgin Islands.....	3	(a)	---	19	(a)	---	6	(a)	---	0	(a)	---	2	(a)	---	34	1.36	---
District 7—Total.....	864	.87	.86	942	.84	.80	1,354	.96	.85	135	.89	1.00	98	.59	.57	2,852	.98	1.01
Iowa.....	93	.70	.54	105	.62	.50	96	.89	.94	23	.65	(a)	2	(a)	(a)	251	1.05	.95
Kansas.....	113	.88	1.01	115	.85	.81	226	.88	.71	17	1.08	(a)	0	(a)	(a)	340	.75	.85
Minnesota.....	35	.57	.71	41	.89	.92	136	.84	.93	7	.89	(a)	2	(a)	(a)	376	1.02	1.01
Missouri.....	504	1.00	.99	582	.97	1.00	749	1.05	.87	66	.89	(a)	47	.63	.50	1,521	1.00	1.21
St. Louis.....	191	.72	.80	331	.80	.82	416	.96	.80	28	.55	(a)	0	(a)	(a)	1,021	1.00	1.21
Nebraska.....	35	.43	.48	54	.58	.65	95	.80	.81	10	(a)	(a)	41	.59	.63	226	1.16	.97
North Dakota.....	44	1.16	1.16	14	(a)	(a)	23	.88	.88	5	(a)	(a)	6	(a)	(a)	43	1.30	1.30
South Dakota.....	40	.91	(a)	31	.49	.60	29	1.38	(a)	7	(a)	(a)	0	(a)	(a)	95	.95	.88
District 8—Total.....	240	.87	.94	184	.70	.84	316	.78	.71	37	1.00	(a)	25	1.25	(a)	702	.96	1.03
Colorado.....	117	.87	.94	86	.75	.92	177	.93	.82	18	(a)	(a)	0	(a)	(a)	417	1.00	1.69
Idaho.....	40	11.1	(a)	12	.38	(a)	45	.79	.55	6	(a)	(a)	20	1.00	(a)	111	1.08	.67
Montana.....	36	.57	.84	29	.48	.66	46	.60	.67	5	(a)	(a)	4	(a)	(a)	41	.64	.90
Utah.....	29	1.21	(a)	23	.77	(a)	28	.56	.48	6	(a)	(a)	0	(a)	(a)	95	.84	(a)
Wyoming.....	18	(a)	(a)	34	1.36	1.38	16	.64	.55	2	(a)	(a)	0	(a)	(a)	38	1.09	.80
District 9—Total.....	1,408	1.03	1.07	2,090	1.02	.88	1,771	1.17	.92	521	1.33	1.00	1,452	.55	.55	8,955	.95	.84
New Mexico.....	80	1.08	(a)	95	.85	(a)	136	1.28	.41	23	1.00	(a)	6	1.06	1.05	261	1.08	1.63
Oklahoma.....	277	.91	.78	384	.82	.93	646	1.03	.91	80	1.14	(a)	71	.54	.54	1,691	.94	.74
Texas.....	1,051	1.06	1.19	1,611	1.09	.86	989	1.26	1.23	418	1.40	(a)	1,381	.54	.54	7,003	.95	.85
Canal Zone.....	3	(a)	---	17	.85	---	39	.78	---	1	(a)	---	0	(a)	---	140	.68	---
Total continental United States.....	17,965	.92	.92	24,676	1.07	1.02	32,837	1.08	1.05	3,900	1.15	1.01	4,745	.89	.84	86,312	1.04	.93
Total United States and Territories.....	18,153	.92	.92	25,799	1.08	1.02	33,364	1.08	1.05	4,251	1.16	1.01	4,750	.88	.84	88,790	1.04	.93

\* Ratio not calculated when base prior quarter is less than 20.

† Data from VM-820.

Source: Form PHS-688 (old No. 8958-B) USPHS—Venereal Disease Division, Office of Statistics 9/9/48 (ML-FD-TM) mjlm.





# *The* JOURNAL of VENEREAL DISEASE INFORMATION

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FEDERAL SECURITY AGENCY  
PUBLIC HEALTH SERVICE

### **Submission of Manuscripts**

In order to facilitate the handling of manuscripts submitted for publication in the JOURNAL OF VENEREAL DISEASE INFORMATION, the editor requests that copy be prepared in triplicate, typewritten, double-spaced, with liberal margins. Statistical tables and charts should be set up according to the style used in the JOURNAL, and should be presented on separate sheets, rather than within text material.

## **FEDERAL SECURITY AGENCY**

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## **PUBLIC HEALTH SERVICE**

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**Editor: THEODORE J. BAUER, *Medical Director***  
***Chief, Venereal Disease Division***



**UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1948**

**For sale by the Superintendent of Documents, U. S. Government Printing Office  
Washington 25, D. C. - Price 10 cents. Subscription Price: Domestic, 75 cents  
a year; foreign \$1.15**

# A Macroflocculation Spinal Fluid Test Employing Cardiolipin-Lecithin Antigen<sup>1</sup>

Arthur A. Rosenberg, Serologist, Ad Harris, Senior Serologist, and Virginia L. Harding, Serologist, United States Public Health Service

The Venereal Disease Research Laboratory slide and tube flocculation tests have been the subject of previous reports (1, 2, 3). These tests, utilizing a cardiolipin-lecithin antigen in a rapidly prepared, stable antigen emulsion are not applicable to spinal fluid testing. It was considered advantageous to develop a test for spinal fluid that would employ the same antigen and retain the desirable characteristics of these tests. The purpose of this report is to describe this companion procedure, which will be referred to as the VDRL spinal fluid test.

Serologic methods designed for testing serum do not necessarily directly lend themselves to the testing of spinal fluid because of the qualitative and quantitative differences between these two substances. The most evident of these differences are associated with (1) protein concentrations and (2) amounts of reactive components. The latter are more highly dilute in the spinal humor. Therefore, in designing a test for spinal fluid, consideration was given to several factors that could influence test reactivity, such as (1) the ratio of spinal fluid to antigen emulsion, (2) the concentration of sodium chloride solution (which acts as a sensitizer of the antigen emulsion), and (3) the period of mechanical shaking prior to centrifugation.

Trial testing of several ratios of spinal fluid to antigen emulsion disclosed that the ability of the test to elicit a positive reaction when a comparatively small quantity of reagin was present was enhanced as the ratio increased. The sensitizing effect of several sodium chloride solutions of varying concentrations was

also observed. Since maximal sensitivity was obtained with 10-percent sodium chloride solution, this concentration was employed in the test technic.

Mechanical shaking, followed by centrifugation, was considered to be the best means of bringing about an easily discernible rapid reaction. The effect of shaking periods of 5 to 30 minutes was noted. Although aggregation of sensitized antigen particles was observed as the shaking period was extended to a full 30 minutes, nearly maximal aggregation occurred during the first 15 minutes. Subsequent centrifugation was found to cause macroscopically visible clumping in some instances in which these aggregates were not formed by mechanical shaking alone. A centrifugation period of 5 minutes was sufficient for this purpose.

Prior to reading, resuspension of the sedimented antigen particles following centrifugation was accomplished by shaking the racks of tubes on a Kahn shaking machine for a 2-minute period. Better standardization of this final step of the test procedure resulted when machine shaking of a definite intensity was employed rather than the more variable hand shaking.

## Test Procedure<sup>2</sup>

### *Preparation of the Antigen Emulsion*

1. Prepare antigen emulsion as described for the VDRL slide flocculation test.<sup>2</sup>

2. Add one part of 10-percent sodium chloride solution to one part of VDRL slide test emulsion. Mix well and allow to stand at least 5 minutes but not more

<sup>2</sup> Copies of detailed technics for the VDRL slide, tube, and spinal fluid flocculation tests can be obtained from the Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island 4, N. Y.

<sup>1</sup> From the Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island 4, N. Y. Medical Director J. F. Mahoney in charge.



than 2 hours before use. This mixture is referred to as "sensitized antigen emulsion."

### **Preparation of Spinal Fluid**

Centrifuge, decant, and heat spinal fluid at 56° C. for 15 minutes. Allow fluids to stand at room temperature 10 or more minutes before testing. Spinal fluids which are visibly contaminated or contain gross blood are unsatisfactory for testing.

### **Qualitative Spinal Fluid Test**

1. Pipette 1.0 ml. heated spinal fluid into a 13 x 100 mm. test tube. Positive and negative spinal fluid controls should be included in each test run.

2. Add 0.2 ml. sensitized antigen emulsion to each spinal fluid. NOTE: Resuspend the sensitized antigen emulsion immediately before use by inverting its container several times.

3. Shake racks of tubes on a Kahn shaking machine for 15 minutes. The shaker must oscillate 275 to 285 times per minute.

4. Centrifuge all tubes for 5 minutes at a force equivalent to 1,800 r. p. m. in a No. 1 I. E. C.<sup>3</sup> centrifuge, or 1,600 r. p. m. in a No. 2 I. E. C. centrifuge.

5. Return tubes to Kahn shaking machine and shake for *exactly* 2 minutes.

### **Reading and Reporting**

1. Read reactions immediately after the secondary shaking period by holding tubes close to the shade of a desk lamp with a black background. (NOTE: Each tube may be held motionless or shaken *gently* during the reading. However, excessive agitation should be avoided.)

2. Report results as follows:

Positive: Definitely visible aggregates suspended in a water clear or turbid medium. All borderline reactions, where the observer has doubt regarding visible clumping, should be reported as negative.

Negative: No aggregation, complete

dispersion of particles; appearance, turbid or slightly granular.

### **Quantitative Spinal Fluid Test**

#### **Preparation of Spinal Fluid Dilutions**

1. Pipette 1.0 ml. of 0.9-percent saline solutions into each of 5 or more tubes.

2. Add 1.0 ml. heated spinal fluid to tube 1, mix well, and transfer 1.0 ml. to tube 2. Continue mixing and transferring from one tube to the next until the last tube contains 2 ml. Discard 1.0 ml. from the last tube. The respective dilution ratios are 1:2, 1:4, 1:8, 1:16, 1:32, etc.

#### **Test Method**

Each spinal fluid dilution is treated as an individual spinal fluid and is tested as described under "Qualitative Spinal Fluid Test."

#### **Reporting of Test Results**

Report results in terms of the highest dilution of spinal fluid producing a positive reaction, as illustrated in table 1.

A comparison of results obtained with the VDRL spinal fluid test and other test technics employing either alcoholic extracts of beef heart or cardiolipin-lecithin cholesterol solutions as antigens is presented in table 2.

To determine the effect of merthiolate on the VDRL spinal fluid test, each of a series of individual spinal fluids was split into three portions for testing. Merthiolate powder was added to two of these aliquots in final concentrations of 1:1,000 and 1:10,000, and the VDRL spinal fluid test was performed on all three portions in accordance with the technic. Identical results were obtained with the merthiolated and nonmerthiolated fractions of each spinal fluid.

### **Discussion**

The findings in table 2 indicate that the reactivity level of the VDRL spinal fluid test is within the limits set by four other widely used testing procedures. The VDRL spinal fluid test technic lends itself to revision, if a change in reactivity is later considered desirable, by (1)

<sup>3</sup> International Equipment, Company, Boston, Mass.

Table 1

Spinal fluid dilutions					Report
1:2	1:4	1:8	1:16	1:32	Positive, 1:8 dilution, or 8 dils (4). Positive, 1:16 dilution, or 16 dils (4). Positive, <sup>1</sup> undiluted only, or 1 dil (4).
P	P	P	N	N	
P	P	P	P	N	
N	N	N	N	N	

<sup>1</sup> Positive reaction with undiluted spinal fluid in the qualitative test.

P=Positive reaction.  
N=Negative reaction.

Table 2.—Results obtained by 5 testing methods on 633 spinal fluids

Tests	Positive (%)		Doubtful		Negative	
	Number	Percent	Number	Percent	Number	Percent
VDRL spinal fluid.....	78	12.4	-----	-----	555	87.6
Kolmer complement-fixation (5).....	72	11.4	14	2.2	547	86.4
Kahn standard (5).....	72	11.4	9	1.4	552	87.2
Eagle flocculation (5).....	22	3.5	2	.3	609	96.2
Kline cardiolipin (6).....	64	10.1	22	3.5	547	86.4

NOTE: Weakly positive reactions in the Kline cardiolipin tests are placed in the doubtful column for the purpose of comparison only.

changing the ratio of spinal fluid to antigen emulsion ratio and (2) changing the basic antigen formula.

Slight changes of the ratio of spinal fluid to antigen emulsion cause corresponding increases or decreases in test sensitivity. A more marked change in test reactivity can be produced by altering the lecithin content of the antigen. However, since efforts have been made to construct a test technic that will produce consistent results, any arbitrary change in the basic antigen or the manipulative procedures, which are explicitly set forth, is not recommended.

Merthiolate (sodium ethylmercurithiosalicylate, Lilly) is frequently employed as a spinal fluid preserving agent for mailed spinal fluids because of its bacteriostatic and bactericidal properties (7). Since reactions observed on split specimens indicate that merthiolate causes no change in test results, merthiolate can be used satisfactorily in conjunction with the VDRL spinal fluid test.

### Summary

1. The technic of the VDRL spinal fluid test is described.
2. Results obtained with the Kolmer,

Kahn, Kline cardiolipin, Eagle flocculation, and VDRL spinal fluid tests on 633 spinal fluids are tabulated.

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# Juvenile Delinquency and Venereal Disease Among Public School Children in Philadelphia<sup>1</sup>

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The relationship between juvenile delinquency and venereal disease is traditional and forms a classic example of how human behavior may correlate with a serious public health problem. This report is a study of the prevalence of venereal disease in youngsters, with particular emphasis on the relationship between venereal disease and juvenile delinquency.

In the past, venereal disease, and more particularly congenital syphilis, has been considered to be a cause of retarded mentality, which may possibly result in juvenile delinquency. There can be no doubt that in some instances the degenerative action of congenital syphilis on the brain results in mental defectiveness to the extent that the child requires special supervision. One study of this sort was made in New Jersey some 13 years ago by Molitch and Eccles (1), in which, among 116 institutionalized boys between the ages of 8 and 18 with positive Wassermanns, they found the incidence of subnormal intelligence to be almost twice as great as that in the general inmate population. They concluded that congenital syphilis was probably an important contributing factor to the retarded intelligence of these boys. The behavior problems resulting from mental deficiency caused by congenital syphilis are not thought of as being materially different from those resulting from other mental defects.

The improved treatment of the syphilitic pregnant woman, the passage of premarital and prenatal examination laws

in the last decade, and the better detection of the disease when it occurs in infancy have resulted in decreasing the incidence of congenital syphilis and made the contribution of this cause of juvenile delinquency increasingly less significant.

On the other hand, venereal disease has also been considered to be a result of juvenile delinquency, and this relationship continues to be important. For this reason, the venereal disease situation during the postwar transition period with respect to school-age children in Philadelphia has been analyzed. The information revealed is probably not peculiar to any one locality, but has application in any other large industrial community.

## Occurrence of Venereal Disease in School-Age Children

In Philadelphia about one-fifth of the syphilis and gonorrhea cases detected occur in children under 20 years of age. Of the 5,839 cases discovered in public school children in Philadelphia between 1945 and 1947, a relatively small percentage (5 percent) were under 13 (table 1). Ages 13 through 15 accounted for 10 percent of the cases. In ages 16 through 19, the frequency of detection increased with age, the years 18 and 19 accounting for more than half of the total cases.

Does this occurrence of venereal disease result from war and from the adjustment to it? In one sense perhaps it does result from the social unrest accompanying the war. There has been a steady numerical increase in Philadelphia in the number of cases of syphilis and gonorrhea reported in the 5 through 17 age groups from 1945 to 1947 (table 2). In 1945, 744 cases were reported, 801 in 1946, and 1,269 in 1947. When this increase is compared with the increase

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**Table 1.—Distribution of 5,839 cases of venereal disease found in school-age children in Philadelphia, 1945–47, by age**

Age	Number	Percent of school-age children (5–19)	Percent of juveniles (5–17)
5.....	22	0.4	0.8
6.....	29	.5	1.0
7.....	35	.6	1.2
8.....	47	.8	1.7
9.....	34	.6	1.2
10.....	40	.7	1.4
11.....	36	.6	1.3
12.....	42	.7	1.5
13.....	85	1.4	3.0
14.....	168	2.9	6.0
15.....	329	5.6	11.7
16.....	856	14.7	30.4
17.....	1,091	18.7	38.8
Total.....	2,814	48.2	100.0
18.....	1,400	24.0	46.3
19.....	1,625	27.8	53.7
Total.....	3,025	51.8	100.0
Grand total.....	5,839	100.0	-----

in reported cases in all age groups, however, it is found that the percentage of cases under 18 years of age has not increased but, if anything, has decreased: 8.4 percent of the total community cases in 1945, 5.7 percent in 1946, and 7.4 percent in 1947.

We feel that one reason for this increase in the number of cases being treated is the greater interest in venereal disease as a public health problem and the popular appeal of penicillin to the general population and to the physician. The majority of cases of syphilis and gonorrhea do not receive treatment immediately following infection. In Philadelphia in 1947, for example, only 23.1 percent of the syphilis patients reported for diagnosis during the initial stages of their disease with open infectious lesions; the remainder had passed beyond this period before they sought medical care.

In most analyses of children under 18, the girls with venereal disease outnumbered the boys. In the present study, this ratio is about four girls to three boys (table 3). The age at which venereal disease occurs most frequently in children under 18 is about 17.5 in all races and in both sexes.

In Philadelphia, syphilis and gonorrhea are reported in school-age children with almost equal frequency (table 4). About 43 percent of the syphilis is seen in the symptomatic early (primary or secondary) stage. About 21 percent of

**Table 2.—Distribution of occurrence of venereal disease among 2,814 school-age children in Philadelphia, 1945–47, by age**

Year	Total cases reported	Total aged 5–17	Percentage in each school-age group						Percent- age under 20
			5–13	14	15	16	17	Total percent- age	
1945.....	8,847	744	1.2	0.4	0.8	2.1	3.9	8.4	20.4
1946.....	14,166	801	.9	.5	.7	1.4	2.2	5.7	17.6
1947.....	17,241	1,269	.8	.4	.9	2.7	2.5	7.4	20.8

**Table 3.—Distribution of occurrence of venereal disease among school-age children in Philadelphia, 1945–47, by sex, race, number, percent, and modal age<sup>1</sup>**

Sex	All races			White			Nonwhite		
	Num- ber	Per- cent	Modal age	Num- ber	Per- cent	Modal age	Num- ber	Per- cent	Modal age
Male.....	1,171	41.6	17.5	39	1.4	17.5	1,132	40.2	17.5
Female.....	1,643	58.4	17.4	96	3.4	17.3	1,547	55.0	17.4
Total.....	2,814	100.0	17.4	135	4.8	17.4	2,679	95.2	17.4

<sup>1</sup> Age at which venereal disease occurred most frequently in children under 18.

Table 4.—Distribution of 2,368 cases of venereal disease among 2,349 school-age children in Philadelphia, 1944-47, by disease

Disease	Venereal disease (congenital and acquired)		Percent of total cases of syphilis	Venereal disease (acquired only)	
	Number	Percent		Number	Percent
Gonorrhea.....	1, 105	46. 7	100.0	1, 105	52. 5
Syphilis.....	1, 258	53. 1		996	47. 3
Primary and secondary.....	540	22. 8		540	25. 7
Early latent.....	392	16. 5		392	18. 6
Congenital.....	262	11. 1		-----	-----
Latent (duration unknown).....	64	2. 7	5. 1	64	3. 0
Other venereal disease.....	5	. 2	-----	5	. 2
Total.....	2, 368	100. 0	-----	2, 106	100. 0

Table 5.—Distribution of 1,187 <sup>1</sup> newly diagnosed cases of acquired and congenital syphilis among school-age children in Philadelphia, 1944-47, by age

Age	Cases of syphilis					
	Acquired		Congenital		Total	
	Number	Percent	Number	Percent	Number	Percent
6.....	2	29	5	71	7	100
7.....	1	12	7	88	8	100
8.....	4	27	11	73	15	100
9.....	5	20	20	80	25	100
10.....	3	12	22	88	25	100
11.....	6	32	13	68	19	100
12.....	15	35	28	65	43	100
13.....	28	44	35	56	63	100
14.....	71	66	36	34	107	100
15.....	118	78	34	22	152	100
16.....	170	87	25	13	195	100
17.....	277	94	18	6	295	100
18.....	229	98	4	2	233	100
Total.....	929	-----	258	-----	1, 187	-----

<sup>1</sup> Some cases were excluded because age was not known or diagnosis was not complete.

syphilis discovered in these school-age children is congenital in origin. If congenital syphilis is excluded from consideration, recently acquired syphilis (including early latent syphilis) forms about 44 percent and gonorrhea about 53 percent of the total venereal disease cases.

An analysis of syphilis by stages among children under 19 shows that congenital syphilis makes up a relatively uniform percentage of all syphilis up to 11 or 12 years of age (table 5). After 12, however, an increasingly larger proportion of the cases are acquired rather than congenital until at 18 years of age, 98 percent of the syphilis cases are of post-natal origin.

We are convinced that a coordinated effort must be made by the Department of Public Health if venereal disease in the teen-age group is to be properly detected and treated. For many years in Philadelphia, as in other areas, the Division of Medical Inspection of the Public Schools has maintained an active interest in the detection of venereal disease among school-age children. Even so, only slightly more than one-fifth of the cases occurring in the schools come to light through school physicians; three-fourths are detected by private physicians and clinics (table 6).

About 2 percent of these cases of venereal disease in individuals under 18 years

**Table 6.—Distribution of 2,349 cases of venereal disease found in school-age children in Philadelphia, 1944–47, by method of detection**

Method of detection	Number	Percent
Private physician or clinic.....	1,755	74.7
Medical inspection in the schools.....	510	21.7
Medical inspection in Juvenile Court.....	49	2.1
Transfer from other health jurisdictions.....	35	1.5
Total.....	2,349	100.0

of age are discovered for the first time through penal and correctional institutions. This figure includes those cases reviewed by the Juvenile Division of the Municipal Court (2). The actual rate of occurrence of venereal disease among juvenile offenders is much greater than this figure would indicate. In most of these cases, however, venereal disease was detected before the child was brought to court.

### Venereal Disease and School Attendance

The normal occupation of children under 18 is attending school. An analysis of the relationship between acquiring a venereal disease and failing to attend school is accordingly of importance for at least two reasons. First, training courses which may lead to decreasing the number of cases of acquired venereal disease could be given in schools. Secondly, school attendance, in the opinion of the authors, is in itself something of a deterrent to acquiring a venereal disease. When the detection rate of venereal disease per 1,000 public school children is compared with the estimated rate for the identical age group in the community as a whole (which includes children not attending school), it is found that in the elementary school age group the rate is the same for both groups (table 7), about 1.5 per 1,000. In the junior high school age group, the rate rises to from 3 to 6 per 1,000 but is still in the same general level for the 2 groups. In the senior high school age group, however, those who remain in school have about one-half of the venereal disease rate of the age group as

a whole. Part of the reason for this may be attributed to the fact that the high school student has his time better occupied.

Altogether, about two-fifths of the children under 18 years of age were attending school when they acquired a venereal disease and about three-fifths were not (table 8). An analysis of reasons for not attending school indicates that self-exclusion without other obvious cause is the most important reason, accounting for approximately one-third of the cases. This group for the most part consists of individuals 15 through 17 years of age not regularly gainfully employed but to whom the classroom seemed to offer less attraction than the other activities of the community.<sup>4</sup> About one-fourth of the individuals in this age group were regularly employed in business or industry at the time they acquired a venereal disease; about 1 in 10 were married or pregnant. Approximately 6 percent of the venereal disease patients in this age group were not attending school because they were confined in a penal or correctional institution.

About 10 percent of the venereal disease cases occurring in children under 18 are found in children of elementary school age (6 through 12) (tables 1 and 9), and we know from table 5 that 75 percent of this is congenital syphilis. On the other hand, one-third of the venereal disease cases in the elementary schools of Philadelphia occur in children between 15 and

<sup>4</sup> According to the school law in Pennsylvania, youngsters must go to school until they are 18. At the ages of 16 and 17, a child may take a full-time job if the situation meets with the approval of the certifying officer, under which circumstances a work certificate is issued. This keeps the child under the nominal supervision of the school. Self-excluded children are those who are working without work certificates, receiving medical attention for venereal disease, etc. Many, on the other hand, are truants. Inasmuch as some are legitimately out of school, with their parents' approval, the word "truant" is not used to describe the group as a whole. The extent to which these children are out of school to receive treatment for venereal disease is not known.



18. The normal upper age for this group is from 12 to 14, so that children 15 to 18 years of age in the elementary schools are definitely retarded and contribute a percentage of venereal disease far in excess of their numbers.

There are at least two reasons for the amount of venereal disease contributed by the retarded pupil in the elementary school. In the first place, the chronologic age of the retarded child places him, from that fact alone, in a group in which venereal disease prevalence is higher. In the second place, mental retardation in itself may contribute to a behavior pattern which may make the acquiring of a venereal disease more probable. This is shown by the fact that about 32 percent of the total number of cases among school-age children come from special schools for retarded children (table 9).

The meaning of this increased probability of venereal disease in the retarded child is a controversial point. Some feel that the presence of venereal disease in retarded children is the result of their chronologic age alone. In our opinion, however, there are important influences other than mere chronologic age, with its accompanying sexual development, which cause delinquent behavior that results in venereal disease (3, 4). This subject has been inadequately reported and analyzed in venereal disease literature.

In recapitulation, an analysis of the occurrence of venereal disease among school-age children in the public schools shows a rapidly increased detection rate between 13 and 17, with most cases occurring at 17. An absolute but not a relative increase in syphilis and gonorrhea has been detected in this age group during

**Table 7.—Distribution of 957 cases of venereal disease in public schools in Philadelphia by estimated rate per 1,000 school population, compared with estimated rate per 1,000 population for the community as a whole**

Age group	Total cases of venereal disease	Estimated population	Estimated rate per 1,000
Public school children:			
6 through 11 (elementary school age)	169	125,355	1.3
12 through 14 (junior high school age)	236	37,120	6.4
15 through 17 (senior high school age)	552	43,202	12.8
Total	957	205,677	
Entire community:			
6 through 11	243	164,808	1.5
12 through 14	295	91,026	3.2
15 through 17	2,276	99,726	22.8
Total	2,814	355,560	
18 and 19	3,025	66,508	45.5
Grand total	5,839	422,068	

Source of total population figures: Department of Public Health, Philadelphia, Division of Vital Statistics; figures were derived from the U. S. Census, 1940.

**Table 8.—Distribution of 2,349 cases of venereal disease among school-age children in Philadelphia, 1944–47, by school-attendance status**

School status	Total cases		Cases not attending school	
	Number	Percent	Number	Percent
Attending school	983	41.8		
Not attending school	1,366	58.2		
Self-excluded (truancy, etc.) <sup>1</sup>			472	34.6
Employed			331	24.2
Pregnant and/or married			122	8.9
In correctional institution			80	5.9
Never in school in Philadelphia			36	2.6
All other <sup>2</sup>			325	23.8
Total	2,349	100.0	1,366	100.0

<sup>1</sup> See footnote 4, page 365. These 472 cases represent 20.1 percent of the total cases.  
<sup>2</sup> "All other" includes such categories as moved out of area, cannot locate, runaway, in military service, dropped from school because over age, and behavior problem.

the postwar transition period. There is a significantly lower detection rate of venereal disease among those who remain in high school, and there is a greater expectancy of venereal disease among those retarded in school.<sup>5</sup> Two percent of the individuals in this age group were first found to have venereal disease when brought before the court, and 6 percent of the venereal disease cases under 18 years of age were kept out of public school through being confined in a penal or correctional institution because of juvenile delinquency.

**Table 9.—Distribution of 643 unselected cases of venereal disease among school-age children in Philadelphia, 1944–47, by type of school attended**

Type of school	Number	Percent
Elementary school.....	64	10.0
Junior high school.....	157	24.4
Senior high school.....	163	25.4
Vocational school.....	36	5.6
Special schools for retarded children.....	206	32.0
Other special schools.....	17	2.6
Total.....	643	100.0

### Venereal Disease Among Juvenile Delinquents (2)

In Philadelphia the Juvenile Division of Municipal Court is a court of record with exclusive jurisdiction in all proceedings affecting dependent, delinquent, or neglected children under 18 years of age. In this Division, sex offenses as such are not an important reason for court action. They form approximately 2 percent of the reasons for reference to the court among the boys and 8.5 percent among the girls. In classifying offenses, the Statistical Department of the Municipal Court considers not only the formal charge by the police officer, petitioner, or complainant, but also the testimony and social investigation in order to determine the most important reason for referring the case to the court. Most important among the reasons for court action other than

<sup>5</sup> Further study is needed to establish whether the causal agency is educational retardation or retarded intelligence.

sex offenses are theft, miscellaneous mischief, disorderly conduct, runaway, vagrancy, and assault and battery. Medical examination for venereal disease is routine for all of these cases.

The rate of occurrence of syphilis and gonorrhea in the delinquent group (through 17 years of age) indicates that the venereal disease rate for those whose antisocial behavior necessitates court action is 4 times greater than the prevalence in the upper 3 years of the high school population (senior high school) (table 10). The rate is 52.6 per 1,000 for the juvenile delinquents as compared with 12.7 per 1,000 for the normal senior high school population (ages 15 through 17). This is partially due to the fact that all juvenile delinquents were examined for venereal disease, whereas every school child was not. The prevalence rate in the juvenile delinquent is, moreover, in excess of the prevalence rate of venereal disease in the adult population in the community as a whole, which recent surveys in Philadelphia have shown to be between 40 and 50 per 1,000.<sup>6</sup>

In contrast to the general population of the community under 18, in which there has been no relative increase in

**Table 10.—Comparative rates of venereal disease in Philadelphia, 1944–47, among teen-age children attending school (15–17), in the general population irrespective of school attendance (15–17), and in juvenile delinquents (through 17)**

Age level	Venereal disease rate per 1,000
Attending senior public high school (15 through 17).....	12.7
General population irrespective of school attendance (15 through 17) <sup>1</sup> .....	22.8
Juvenile delinquents in Philadelphia Municipal Court (through 17) <sup>2</sup> .....	52.6

<sup>1</sup> Includes those in the "Attending senior public high school (15 through 17)" age group; figures taken from the corrected U. S. Census for 1940.

<sup>2</sup> Approximately one-third of the court cases disposed of by the Juvenile Court of Philadelphia are under 14. Insufficient data are available to relate the venereal disease prevalence specifically to the 15 through 17 age group so that through the inclusions of the younger age group the rate per 1,000 in the table is a slight underestimate of the problem in the strictly comparable age group.

<sup>6</sup> Data taken from unpublished material.

the incidence of syphilis and gonorrhea during the postwar transition period, there has been a definite rate of increase with the juvenile delinquent (table 11).

**Table 11.—Venereal disease among juvenile delinquents by years in Philadelphia Municipal Court, 1944–46 (2)**

Year	Total cases examined	Number infected	Rate per 1,000
1944.....	3,606	134	37
1945.....	3,597	182	51
1946.....	3,086	225	73

**Table 12.—Venereal disease among juvenile delinquents in the Municipal Court of Philadelphia, 1944–46, by age, sex, and race (2)**

Age	Boys			Girls			White			Negro		
	Number examined	Number infected	Rate per 1,000	Number examined	Number infected	Rate per 1,000	Number examined	Number infected	Rate per 1,000	Number examined	Number infected	Rate per 1,000
Under 16.....	4,130	32	7.7	1,141	89	78.0	2,797	29	10.4	2,474	91	36.8
16 and 17.....	3,819	164	42.9	1,099	256	232.9	1,854	119	64.2	2,264	301	133.0

The prevalence of venereal disease among the juvenile delinquents was 37 per 1,000 in 1944, 51 per 1,000 in 1945, and 73 per 1,000 in 1946. That this increase was not reflected in the youth population of the community as a whole emphasizes the positive correlation of venereal disease with juvenile delinquency. In this selected group, venereal disease is of increasing importance. The question might be raised as to whether the increase of venereal disease among juvenile delinquents in this 3-year period represents improvement in the medical detection mechanism rather than in actual increase of the disease. The medical examination procedure employed for venereal disease in the court is under the supervision of the Department of Public Health and has been peculiarly stable, even to the extent that the same expert medical personnel have been employed throughout the entire period of this study.

The sex difference noted in the normal population under 18, in which the venereal disease incidence in girls was slight-

ly greater than in boys, is much accentuated in the juvenile delinquent group (table 12). Thus, among 4,130 delinquent boys and girls under the age of 16, the venereal disease prevalence rate for boys was 8 per 1,000 but for girls was 10 times that figure, or 78 per 1,000. In the 16 and 17 age group, the difference between the two sexes was not as marked (ratio of 1 to 5), but the rate for girls has reached a magnitude of 233 per 1,000 as contrasted to 43 per 1,000 for the boys.

The race differentiation in venereal disease incidence is much less marked in the juvenile delinquency group than it is

for the community as a whole (table 12). The occurrence of venereal disease in the school-age group reflects the ratio existing in the community as a whole, namely, white to nonwhite as 1 to 20<sup>7</sup>. In the juvenile delinquent group under 16, however, the ratio was 1 to 4 and in the 16 to 17 age group, the ratio was as 1 to 2, or 64 per 1,000 among the whites and 133 per 1,000 among the Negroes. This marked difference between the community as a whole and the delinquent children, so far as racial influence is concerned, probably has a socioeconomic significance. It points to the thought that the true racial difference in acquiring venereal disease is probably by no means as great in people with a common background as is generally believed among epidemiologists.

The positive correlation between venereal disease and juvenile delinquency is accordingly indisputable. The early

<sup>7</sup> Selective Service figures for syphilis detected in Philadelphia showed a rate of 9 per 1,000 for whites and 182 per 1,000 for nonwhites.



stages of juvenile delinquency occasionally take the form of sex delinquency, but on the whole congenital syphilis is the principal cause of venereal disease among the younger children. As the child grows older and delinquency persists and becomes more marked, its effect in increasing the venereal disease rate becomes more definite, until ultimately the rate exceeds by several times the rate for the comparable age group in the normal population.

### **Theoretical Contributory Factors to Juvenile Delinquency and Venereal Disease**

By the time the juvenile offender reaches the attention of the court or the health authority, the past history indicates that offenses have occurred for at least 6 months and frequently longer prior to detention (5). The underlying causes of delinquency in the individual often date back many years and are deeply rooted in his family, social, community, and emotional life.

A logical approach to the problem would be to aim at preventing early antisocial sexual behavior (6). In the preschool age this problem could be reached through education of the parent and in the school age through free utilization of the school teacher or counselor in conjunction with the parent. Juvenile offenses for the most part appear to be an exaggerated attempt at independent action, whether by running away from undesirable home surroundings or by breaking away from overstrict parents. As Edkins says, "Some attempt to loosen the ties of home and parental control is natural to every adolescent, and if the home is undesirable, or in any way unsuitable for the young person, this attempt at breaking away can be turned to constructive ends, favouring an independent maturity and social adaptation." However, this attempt may be fraught with difficulties needing social guidance.

The type of home situations which lead to juvenile delinquency are to some extent almost stereotyped (4, 7, 8). There is usually some conflict with parental authority or some gross defect in parental

guidance. Usually the predelinquent juvenile does not live with both the natural parents. A home broken by divorce, by death of one parent (sometimes with introduction of step- or foster-parents), by chronic alcoholism, by prolonged illnesses, and not infrequently by prison records is the rule. The initial attitude of the juvenile delinquent is usually one of resentment against a particular individual in the household. This leads to dissatisfaction with the home. It should be remarked that sex delinquency is not ordinarily a direct result of poverty and, moreover, it must not be concluded that development of delinquency is the inevitable product of disorganization of the home.

Home situations frequently lead to conflicts which result in a feeling of boredom with the work at school. Since school attendance is the principal occupation in the juvenile age group, a break in school attendance is frequently one of the earliest stages of juvenile delinquency. The attitude of very young children toward authority, the family, and the social group will often give an accurate indication of need for adjustment. Excessive aggression or withdrawal during adolescence is considered a danger signal (9).

Yet many of the factors which influence venereal disease and juvenile delinquency are not inherent in the individual or the family but are basic in society itself. As Luehrs points out (10), "Boys and girls, men and women with strong, normal sex drives, with little experience in self-denial, with lessening fear of the consequence of venereal disease because of its treatability, with little religious fear of punishment for sin, with marriage hard to achieve and no longer a real sacrament, with a cynical opinion of the stability of family life, with constant stimulation from their surroundings—such young people are going to continue to risk getting venereal disease despite having information, despite eradication of prostitution, and despite improvement of treatment facilities. Any effective campaign must be adjusted to the basic facts."

## Fundamental Approaches to the Problem

One basic and fundamental fact is that teaching children about sex hygiene is insufficient to prevent exposure. Much has been said about expanding sex education programs. It is evident that such training should be given in infancy and childhood, if possible well before 13, before the behavior patterns described above develop. It is, moreover, fundamental that the venereal diseases are more prone to occur in the less intelligent; particular attention is accordingly necessary in the preparation of educational material suitable for the retarded group.

It is axiomatic that most of the problems associated with venereal disease and juvenile delinquency are individual ones which would be difficult to solve by any mass approach. In addition to what may be done by parents, who are frequently unable to give their children the kind of guidance and supervision they need even if they were trained to do so, and by the church, which is usually not sought as an influence by juvenile delinquents, the trained school counselor should be made available to help with this problem. The school counselors have the potentiality of reaching practically all children in the formative periods of their lives and may touch upon the physical, mental, social, and emotional aspects of their development.

But the task of preventing venereal disease and juvenile delinquency cannot be delegated solely to experts. As citizens we must take a vigilant interest in the community life that affects our children. The Rev. C. E. Silcox, of Toronto, Canada, has aptly stated (11), "There are, of course, some rare souls who, perhaps, can live for all humanity. Most of us, however, find humanity in the intimate circle of our own home; and when, because of the tragic element in life, that circle is broken, it requires a stern effort of an indomitable will to find some new dynamic in the need of our common humanity." The cherishing of home and family life is the strongest defense against juvenile delinquency and venereal disease.

## Summary

1. This paper presents the results of a study of venereal disease reported in school-age children in Philadelphia during the period 1944-47 and reports on the prevalence of venereal disease in children brought to the attention of the juvenile court during the period 1944-47.

2. In Philadelphia, about one-fifth of the reported cases of venereal disease occur before the age of 20. Of the known cases of syphilis occurring before the age of 20, over 50 percent were reported at the ages of 18 and 19.

3. Although there has been a steady increase in the number of cases of venereal disease reported in children under 18, the proportion which those cases form of the total cases reported has not increased. However, there has been a definite rate of increase of venereal disease among juvenile delinquents.

4. Syphilis and gonorrhea are reported with almost equal frequency in school-age children.

5. Venereal disease is reported somewhat more often among young girls than among young boys. Among the delinquent group, there is a considerably higher venereal disease prevalence rate for girls than for boys up to 18 years of age.

6. In the senior high school age group, those who remain in school have only about one-half of the venereal disease rate of the age group as a whole, and there is a greater expectancy of venereal disease among children retarded in school.

7. The rate of occurrence of venereal disease in the delinquent group (through 17 years of age) is 4 times greater than the reported rate in the upper 3 years of high school. The prevalence rate in the juvenile delinquent is, moreover, in excess of the prevalence rate of venereal disease in the adult population in the community as a whole.

8. The race differentiation in venereal disease prevalence is much less marked in the juvenile delinquent group than it is for the community as a whole.

9. It is indisputable that juvenile de-

linquents have a significantly higher rate of venereal disease than is reported among other children of the same age.

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## Contact Reporting by Merchant Seamen<sup>1</sup>

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The following is a report of contact information received from 149 merchant seamen, illustrating the potentialities for the international spread of venereal diseases.

The merchant seamen studied were patients admitted for treatment of primary and secondary syphilis at the United States Marine Hospital, Staten Island, during July, August, and September, 1947. Of these patients, 135 were American merchant seamen, and the remainder were foreign seamen shipping under Norwegian, Swedish, Honduran, and Spanish flags. One hundred and

eight of these patients were white and 41 were colored; they varied in age from 17 to 69, the median age being 25. The range in education was also wide. There were patients with no formal education, some with several years of grade school, some high school graduates, and a few who had some college education. Of these men, 112 were single, 26 married, 5 separated, 4 divorced, and 2 widowed. One must bear in mind that, although wide variations in age, race, marital status, and nationality are displayed, this is not to be considered a representative sample of merchant seamen, since they were all drawn from the same treatment center.

<sup>1</sup> From the U. S. Marine Hospital, Staten Island, N. Y.



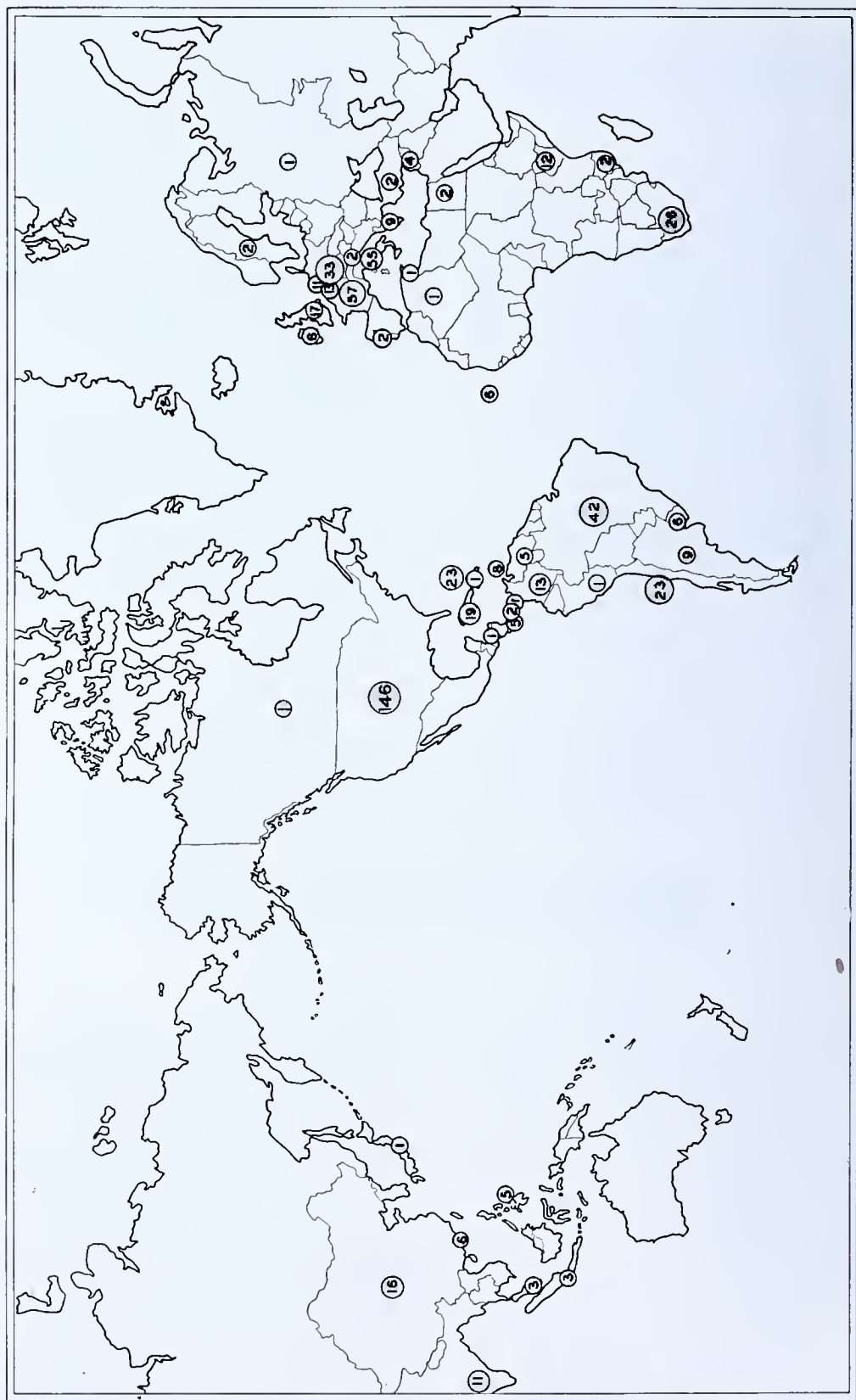


FIGURE 1.—Distribution of sexual contacts of 80 merchant seamen by country of exposure.

Interviewing followed the pattern similar to that in most rapid treatment centers. Soon after diagnosis, groups of patients were given illustrated talks on various aspects of venereal disease, emphasizing in particular the patient's responsibility in naming his sex contacts. These talks were followed by individual interviews. The objective and sympathetic attitude of the interviewer made it easy for the men to reveal information about their sex contacts, which they did with little or no hesitancy. In many instances, they prepared lists of names and addresses in advance of the personal interview, and many offered their address books, letters, and snapshots to help in the search for their contacts. When sufficient information to justify an investigation was obtained, an epidemiologic form was mailed to the health officer of the city in which the contact lived or to the Surgeon General of the United States Public Health Service for disposition to foreign health jurisdictions.

The most striking fact noted from this study is the evidence of the potentiality of world-wide spread of infection through a few individuals. The seamen in this group had possible infectious exposures in every continent except Australia. Only the first 80 men in the group were analyzed in detail. They had had intercourse with a total of 615 individuals in 112 different ports in 45 different countries. There was an average of 1.3 contacts per port of call per seaman. In one instance, a seaman reported intercourse with 90 different individuals during the probable period of his infection. Another seaman reported intercourse with individuals in six different ports. The total group of 149 seamen reported having had sexual relations with 1,098 different persons, or an average of 7.3

contacts per seamen, during the period of possible incubation or infectiousness.

Language difficulties and the seaman's unfamiliarity with the foreign cities probably account for the disappointingly low percentage of cases in which the patient gave enough information regarding his sexual partner to warrant the preparation of an epidemiologic report. The average number of such reports prepared per patient interviewed was 0.68, which is less than half the corresponding figure for State health departments.<sup>2</sup>

Although reports of the investigation of the contacts named by these seamen were far from complete, quite often the forms returned from foreign countries contained, in addition to reports of the results of investigation, written indications of the gratitude of foreign health officers for the receipt of this type of information. For example, the health officer of a large foreign seaport wrote, "Our experience in this clinic is that notifications from your Department do play a useful part in bringing to our notice contacts who might otherwise remain untreated."

## Summary

1. This paper presents a report on the sexual contacts named by merchant seamen with primary or secondary syphilis, treated at the United States Marine Hospital, Staten Island, N. Y., during July, August, and September 1947.

2. The potentialities for the international spread of venereal disease is illustrated by the fact that the first 80 seamen interviewed admitted intercourse with a total of 615 individuals in 112 different ports in 45 different countries.

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<sup>2</sup> Statistical Letter, Venereal Disease Division, U. S. Public Health Service.

NOTE: Abstracts of any article listed below are available on request. In addition, abstracts of articles concerned with venereal diseases or related subjects which have been published in the better-known journals during the past 20 years are in the files. These are open to workers in the field. An asterisk (\*) before a title indicates that the article is abstracted below.

## ACTA DERMAT.-VENEREOL., STOCKHOLM

A seroresistant case of third generation syphilis with liquor changes. Einar Hollström. 28: 1-6, Fasc. I, 1948.

## ACTA MED. ORIENT., PALESTINE

Penicillin therapy of early syphilis. F. Stern. 5: 273-276, 1946. [Abstracted in *Excerpta Med.* (Sec. 13—Dermat. & Venereol.), Amsterdam, 2: 62, Jan. 1948.]

## ACTA MED. SCANDINAV., STOCKHOLM

Kidney complications during sulphonamide therapy. A. Harrestrup Andersen and Ib. Andersen. 130: 259-282, Fasc. III, 1948.

## ACTAS DERMATO-SIF., MADRID

Contribucion al tratamiento de la linfogranulomatosis inguinal subaguda. Contribution to the treatment of subacute inguinal lymphogranulomatosis. J. Marinoso. 38: 524-528, 1947. [Abstracted in *Excerpta Med.* (Sec. 13—Dermat. & Venereol.), Amsterdam, 2: 69-70, Jan. 1948.]

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New data on gonorrhea in women treated with penicillin. (Novye dannye o lechenii gonorrhie u zhenshchin penitsillinom.) Z. Z. Pevzner. No. 3: 26-29, 1946. [Abstracted in *Gen. Pract. Clin.*, Washington, 5: 86-87, Jan. 1948.]

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La pseudo-gonococcie entérétique. Enteric pseudo-gonococcal infection. J. R. D'Eschougues. 50: 335-336, 1946. [Abstracted in *Excerpta Med.* (Sec. 13—Dermat. & Venereol.), Amsterdam, 2: 72, Jan. 1948.]

## AM. J. CLIN. PATH., BALTIMORE

Cardiolipin-lecithin-cholesterol antigen in the precipitation test for syphilis. Influence of ratio of lecithin to cardiolipin on antigen activity. Rachel Brown. Technical Section. 18: 565-567, July 1948.

## AM. J. M. TECHNOL., LAFAYETTE

Preliminary report on the use of cardiolipin antigens in the serodiagnosis of syphilis at Santa Rosa Hospital. Phyllis Denison Shaw. 14: 7-12, Jan. 1948.

## AM. J. SYPH., GONOR. & VEN. DIS., ST. LOUIS

\*Laboratory diagnosis of granuloma inguinale and studies on the cultivation of the Donovan body. Robert B. Dienst. 32: 301-306, July 1948.

\*Radioactive tracer techniques and their possible application to studies in syphilis. Paul D. Rosahn. 32: 307-316, July 1948.

\*Therapeutic efficacy of sodium penicillin and of penicillins F and X in experimental rabbit syphilis. Paul D. Rosahn, Boris Gueft and Catharine L. Rowe. 32: 317-326, July 1948.

**Laboratory diagnosis of granuloma inguinale and studies on the cultivation of the Donovan body.** Robert B. Dienst. *Am. J. Syph., Gonor. & Ven. Dis.*, 32: 301-306, 1948.

In a discussion of laboratory procedures used in the diagnosis of granuloma inguinale, the author considers three techniques which may be used to substantiate the clinical diagnosis of the disease. These consist in determination of: (1) the presence of Donovan bodies by stained tissue smears or by biopsy; (2) the presence of complement-fixing antibodies in the serum; and (3) skin reaction to an intradermal inoculation of Donovan body antigen. The examination of smears using Wright's stain is considered to be the simplest and most accurate of these techniques, since there exists no other micro-organism with morphologic and staining characteristics which can be confused with the Donovan bodies as seen in the cytoplasm of the large mononuclear cells always associated with exudate from the lesions of granuloma inguinale.



It is noted that whereas one smear is often sufficient to demonstrate Donovan bodies in typical clinical cases of the disease, several attempts at tissue smear may be necessary to demonstrate the characteristic intracellular Donovan bodies in atypical, uncomplicated, and early lesions.

Although the cultivation of recently isolated strains of Donovan bodies has been reported in yolk sac or embryonic chick yolk only, the author has been successful in growing these organisms in fresh unincubated yolk medium prepared from fertile and from infertile eggs. It was found that the addition of a small amount of agar to the yolk medium furnished the factor essential for cultivation in vitro and enabled the plain yolk medium to support the growth of freshly isolated strains of Donovan bodies.

The technic used in this study is described in detail. The yolk medium best suited for cultivation contained 0.12 percent agar, with maximum multiplication of the organisms seen after incubation for 4 days at 37° C. A 25-percent concentration of fresh yolk was found necessary for optimum growth, and the organisms remained viable in this medium for 8 to 10 days when stored at room temperature or in refrigeration. Egg yolk apparently contains nutritional factors not found in human blood, since replacement of diluted yolk by defibrinated human blood produced no growth of Donovan bodies.

It is pointed out that the ability to grow these organisms in a cell-free medium greatly facilitates laboratory study and that cultivation of the Donovan bodies in fresh rather than in embryonic yolk offers an added advantage.

**Radioactive tracer techniques and their possible application to studies in syphilis.** Paul D. Rosahn. *Am. J. Syph., Gonorr. & Ven. Dis.*, 32: 307-316, 1948.

This report reviews briefly some of the simpler terminology of nuclear physics, surveys the methods used in tracer studies, and makes recommendations for the employment of radioactive tracer technics in the study of syphilis.

According to the author, isotopes are different forms or atomic weights of a given element, all of which react chemically in an identical manner. Radioactive isotopes have varying degrees of stability and a characteristic half life, which is the length of time required for the radioisotope to deteriorate to one-half its original activity, during which time alpha particles, beta rays, or gamma rays are emitted. By means of a Geiger counter, the amount or quantity of the radioactive isotope can be calculated. Tagging an element means the preparation of a radioactive isotope which, because it emits rays, can be traced in the tissues of the organism, affording knowledge as to its utilization, distribution, and excretion. Only a minute and harmless amount of the tagged isotope is required for tracing in the organism, it is noted.

Three technics are enumerated for tracing tagged elements: (1) the in vitro technic, in which the tissues, body fluids, or excretions of the host are weighted and ashed and the amount of radioactivity determined by means of the Geiger counter; (2) the in vivo procedure, by which the localization and concentration of the administered tagged element are determined by placing the Geiger counter over various portions of the body; and (3) autoradiography, in which a slide with a thick layer of photographic emulsion is mounted with sectioned tissues and developed, revealing dark zones which indicate the precise localization of the radioactive isotope in the tissues.

In a consideration of the possible use of tracer technics in syphilitic studies, it is pointed out that the tagging of treponemes is more difficult than the tagging of other organisms because pathogenic treponemes have not yet been grown in pure culture; successful tagging has so far been accomplished in vitro, however, by adding a salt containing radioactive phosphorus to the culture medium. According to the author, all efforts to tag the treponeme would be enhanced by a knowledge of the chemical constitution of the organism, to which end a syste-

matic biochemical study of the organism is indicated to discover any rare or unusual elements which it may contain, the addition of which elements in tracer doses to various culture mediums might yield information on the metabolism of the organisms.

In studies on the tagging of therapeutic agents, the metabolism of arsenic has been investigated with tracer quantities of the metal, and it has been observed that in man, arsenic in this form does not pass from the blood into the spinal fluid in detectable amounts, the largest amounts being stored in skeletal muscles. The author believes that more precise information could be obtained on the metabolism of therapeutic agents containing arsenic by tagging neoarsphenamine and mapharsen with a radioactive isotope of arsenic ( $\text{As}^{74}$ ), using both human and animal hosts. Similar studies could be pursued with penicillin when a properly tagged preparation becomes available, according to the author. Frequent treatment failures may be accounted for if such studies show that antisyphilitic arsenicals do not concentrate in large amounts in the lymph nodes of the syphilitic human being.

Among the recommendations made in this report are: (1) further study of the metabolism of the treponeme, employing tracer methods, to throw light on growth requirements and suitable culture mediums; (2) the use of radiophosphorus, radioarsenic, or other radioactive isotopes in attempts to tag the treponeme in vitro or in vivo; and (3) attempts to tag the distribution of therapeutic agents, such as the arsenicals and penicillin, in the tissues of the host in order to understand their localization in syphilitic lesions.

**Therapeutic efficacy of sodium penicillin and of penicillins F and X in experimental rabbit syphilis.** Paul D. Rosahn, Boris Gueft and Catharine L. Rowe. *Am. J. Syph., Gonorr. & Ven. Dis.*, 32: 317-326, 1948.

The authors describe the final results of a study, begun in July 1945 by the

Syphilis Study Section of the National Institutes of Health, to investigate the effectiveness of various penicillin fractions in the treatment of experimental syphilis, with the ultimate objective of utilizing such information for the guidance of clinicians in the treatment of human syphilis. Since the authors' observations on penicillins F and X in this study were at variance with those of other investigators, the experiments on the therapeutic efficacy of sodium penicillin and of crystalline penicillins F and X were repeated and are reported herein.

Rabbits weighing from 2.5 to 4.2 kg. were employed for bilateral intratesticular inoculations of active orchitic material from routine passage animals infected with the Nichols strain of *Treponema pallidum*. Only darkfield positive animals received treatment, which began 6 weeks after inoculation and consisted of 24 equal doses of penicillin at intervals of 4 hours. All animals were observed for 4 months following completion of therapy, during which period frequent clinical examinations were conducted and suspicious lesions were examined by darkfield. At the end of the 4 months, all animals which were still negative were sacrificed and the popliteal lymph nodes emulsified with saline and rabbit serum; this emulsion was then inoculated into each testicle of two normal rabbits, which were then observed for 3 months. At the end of this time, the parent animals of all the negative transfer animals were considered to have been successfully treated.

Details of the experiments performed in this study are presented in tabular form. The sodium penicillin used contained 30 percent F, 35 percent G, and 35 percent K; the crystalline penicillin F contained 90 percent F; and the crystalline penicillin X consisted of more than 90 percent X. It was seen that on a 24-dose, 4-day schedule, the use of crude sodium penicillin resulted in a  $\text{CD}_{50}$  of 2,375 Oxford units per kilogram, while crystalline penicillin F yielded a  $\text{CD}_{50}$  of about 8,000 Oxford units per kilogram, and crystalline penicillin X produced a

CD<sub>50</sub> of 4,400 Oxford units per kilogram. These CD<sub>50</sub> values, derived by the application of the Reed-Muench formula, were in general agreement with those obtained by the graphic method of Litchfield and Fertig, it is noted. Sodium penicillin was found to be significantly more effective than both penicillins F and X, while penicillin X was significantly more effective than penicillin F. Combining the findings on penicillins F and X in this study with those already reported for penicillins G and K, the following comparative assays were obtained: G=100, X=34, F=19, and K=>9.

In summary, penicillins F and X were observed to be in intermediate positions between penicillin G, the most potent preparation, and penicillin K, the least potent, while sodium penicillin was seen as relatively more effective than penicillins F, X, or K.

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Complement-fixing antibodies of lymphogranuloma venereum in mice: their development and response to sulfonamide therapy. Margaret J. Wall. J. Immunol., 55: 358-361, 1947.

The author presents results of a study of the development of complement-fixing antibodies in mice infected with the agent of lymphogranuloma venereum and of the effect of different programs of sulfonamide therapy upon the titer of circulating antibodies. Materials, methods, and experimental results are reported in detail.

Young adult Swiss mice, free from infection with neurotropic viruses, were inoculated intracerebrally with lymphogranuloma venereum virus. Four strains of the virus of lymphogranuloma venereum were used as inoculums. Treated mice were given 0.1 percent of sulfadiazine in their drinking water. None of the animals showed any toxic effects from the drug.

Tests for complement-fixing antibodies in untreated mice were made at various intervals of time after the intracerebral inoculation of infected material. Antibodies in low titer usually could be detected at 1 week and were always present at the end of 2 weeks after inoculation. A peak in titer was reached 3 to 5 weeks after infection. When survivors of the experiments were tested at 5, 7, and 18 weeks after inoculation, antibodies had persisted in high titer. Virus could be recovered from the brains of the animals at any time after the appearance of signs of illness and throughout the period of recovery. Complement-fixation titers of mouse antisera were approximately the same with heterologous as with homologous sera.

Complement-fixing antibodies were not demonstrated in mouse sera when they were tested with antigens prepared from the J. H. strain of virus with which the commercial antigen is made. This finding occurred with both the commercial lygranum antigen and with two antigens processed in the laboratory from the J. H. strain of virus.

When sulfonamide therapy was started at the time of inoculation and continued

for 4 to 5 weeks, complement-fixing antibodies were not detected at the end of treatment. In mice treated after the infection had been established, titers of antibody were lower than in control animals, and a definite relationship was found between the end titer and the duration of therapy. Negative tests could be obtained with prolonged therapy, it is stated.

The isolation of virus from animals on sulfonamide therapy was accomplished long after the initial infection in every test made, regardless of the promptness or duration of treatment. However, both of these factors appeared to modify the infection.

Information was obtained on a correlation of the amount of virus present with the antibody titer. Untreated mice which had a high titer of antibody yielded virus readily. On the other hand, the incubation period of virus recovered from treated mice depended upon the program of chemotherapy.

Three graphic figures are presented in conjunction with the article.

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## CURRENT NOTES AND REPORTS

### To the Field

The editor knows that you are more interested in doing a good job than in telling us about it. And that's the way it should be.

There are times, however, when a bit of publicity serves as an inspiration to greater achievement for those actively engaged in the projects and as a guideline to readers who have similar problems.

We know that we are asking a real favor when we say, won't you please "probe" into your various activities and see what you find that might be of interest to other areas? We are especially on the alert for new research and training programs, new methods of case finding, educational experiments, successful cooperative projects, surveys, and control technics, and interesting case reports.

Only with your cooperation can we hope to make "Current Notes and Reports" the kind of clearing house for new ideas and information which will be of maximum value to our readers.

### Carnival Technic in Venereal Disease Education—Michigan Fairs

**J. A. Cowan, M. D., M. S., Director, Bureau of Venereal Disease Control, Michigan Department of Health<sup>1</sup>**

State and county fairs appear to offer an excellent opportunity for venereal disease education, as indicated by the fact that 23,000 persons attended the venereal disease exhibit which was held at seven Michigan fairs between August 9 and September 25. The fairs covered were the Michigan State Fair held annually in Detroit, and the six county fairs at Ionia, Caro, Escanaba, Bay City, Marne, and Ludington.

<sup>1</sup> The staff who ably assisted in this project consisted of: Mr. William Madden, Venereal Disease Consultant for Michigan, who helped with the over-all planning, analyzed the evaluation cards and statistics; Mr. Richard McAvoy, Field Representative, who acted as barker, manager, and handy man; George Jennings, Projectionist and Photographer; four nurses, who worked in teams of two in distributing evaluation cards, literature, and in handling the crowds; and one truck driver.

Total attendance at the fairs was 1,219,772. While 20,198 persons filled out questionnaires, it is estimated that about 23,000 persons saw the movie shown at the exhibit. It must be pointed out that it had been decided to limit the filling out of cards to the seated movie audience, in order to prevent congestion in the tent, which seated only 55. After the audience was seated and the cards had been filled out and collected, as many people as possible were allowed to enter and stand wherever space was available. All of these people saw the complete show and received the literature on venereal disease.

Of particular interest is the fact that 55 percent of the audience were between 15 and 30 years of age, the age group which has the highest reported venereal disease rate. More than half of the total



attendance (58 percent) at the exhibit had attained a tenth grade education. The occupational grouping for those attending the exhibit as compared to the 1940 State population was as follows :

	Percent	
	Exhibit	1940 Census
Professional and pro-		
prietors.....	8.7	12.0
Skilled workers.....	31.7	29.1
Unskilled workers.....	12.8	11.1
Housewives.....	21.2	29.4
Students.....	13.8	9.0
Other and Unknown.....	11.8	9.4
Total.....	100.0	100.0

There were many problems to be solved. The first was to obtain adequate space in a prominent location on the midway. Arrangements for concessions at fairs are frequently made as much as a year in advance, and the best locations are sold at a premium. This project was planned only a few months before the opening date, and there was only a small budget to spend on the entire project. The idea of a venereal disease exhibit on the midway had to be sold to the committees managing the fairs.

Next, equipment had to be obtained. The total equipment bought for this project cost \$840 and consisted of a 20' by 40' tent, 55 chairs, an outdoor electric sign, and other miscellaneous exhibition equipment. Other equipment already available to the State health department and used



Figure 1.—Waiting their turn to see the show.

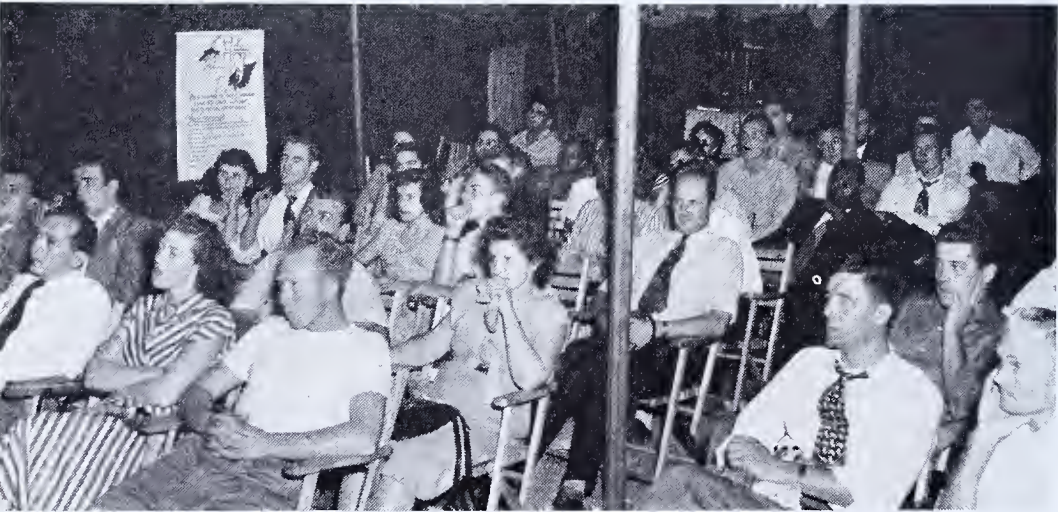


Figure 2.—Candid camera shot of audience reaction.

in the project consisted of an amplifying system, a phonographic system, and equipment for showing the movie.

Another problem was to decide on the type of information that should be obtained from the audience. Since experimental projects such as this are not very significant as a basis for future projects unless certain evaluations can be made, it was decided to give to each person who entered an "evaluation" card which asked for his age, sex, color, occupation, and education level.

The most difficult problem of all was deciding on the type of approach to use in attracting an audience—in other words, what publicity should be used in front of the tent. The natural inclination was to appear professional and dignified, but it was felt that this type of approach would not have mass appeal at a fair, so the carnival approach was adopted, as the accompanying pictures illustrate.

Fair crowds are restless and eager to move on. This had to be considered in planning the exhibit show. The educational movie "Know for Sure," which took only 22 minutes to show, was chosen because, with good professional acting (1) it showed people from various walks of life—the storekeeper, the truck driver, the college student, etc.; (2) focused attention on the different ways that syphilis is acquired—by children before birth, by patronizing houses of prostitution, by casual pick-ups; (3) dramatized the importance of taking your problem to a physician or

to a public health clinic rather than to a "quack"; and (4) presented the facts in such a way that no one could take offense.

As the crowd left, a new venereal disease record "Bad Blood Blues" was played, and each person was handed six educational pamphlets. The literature consisted of "Solid Facts for 'Teen-Age' Folks," "Syphilis, Its Cause, Spread, and Cure," "Gonorrhea, Its Cause, Spread, and Cure," "What Every Woman Should Know," and the "Doc Carter Venereal Disease Comics," a series of two comic books.

In general, attendance at the exhibit was considered to be satisfactory. At the State fair in Detroit people stood in line for hours, even in the rain and mud, to wait their turn to see the show. The staff queried people from all walks of life—such as school superintendents, housewives, farmers, and skilled and unskilled workers—about the show. Comments from those attending were all favorable, with the exception of a few who expected to see something sensational and risqué and were disappointed. Of import is the fact that there were no unfavorable comments from the medical profession and the clergymen.

It is hoped that this show can be repeated next year, preferably with a larger tent, an up-to-date movie, a better location on the midway, and at least two additional men on the staff to act as a relief team in the same way that there was a relief team this year for the nurses.

# STATISTICS

## Previously Untreated Syphilis Cases Diagnosed or Admitted by Public Facilities in the Continental United States and United States and Territories, by Quarters

### CONTINENTAL UNITED STATES

Period	Total	Primary and secondary	Early latent	Congenital	Other
Fiscal 1947.....	172,593	64,480	58,883	7,454	41,776
First quarter.....	46,494	17,948	15,292	1,779	11,475
Second quarter.....	42,162	15,655	14,097	1,662	10,748
Third quarter.....	42,784	16,137	14,549	1,930	10,168
Fourth quarter.....	41,153	14,740	14,945	2,083	9,385
Fiscal 1948.....	163,631	50,819	55,463	8,795	48,554
First quarter.....	45,422	15,045	15,346	1,990	13,041
Second quarter.....	38,438	12,348	12,758	1,865	11,467
Third quarter.....	40,664	12,465	13,747	2,363	12,089
Fourth quarter.....	39,107	10,961	13,612	2,577	11,957

### UNITED STATES AND TERRITORIES

Fiscal 1947.....	182,298	65,785	63,061	9,423	44,029
First quarter.....	48,688	18,307	16,203	2,182	11,996
Second quarter.....	44,249	15,955	14,960	2,176	11,158
Third quarter.....	45,425	16,456	15,702	2,462	10,805
Fourth quarter.....	43,936	15,067	16,196	2,603	10,070
Fiscal 1948.....	171,709	51,747	59,224	10,115	50,623
First quarter.....	47,892	15,354	16,416	2,390	13,732
Second quarter.....	40,150	12,559	13,523	2,130	11,938
Third quarter.....	42,370	12,675	14,571	2,640	12,484
Fourth quarter.....	41,297	11,159	14,714	2,955	12,469

Source: Form 8954-A and VD-3—Public Health Service Venereal Disease Division, Office of Statistics, 10/15/48 (RR-MC)mjm.



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